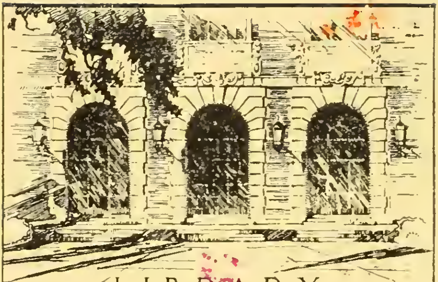


LEARNING AND LABOR.

Catalogue and Circular

—OF THE—

Illinois Industrial University,

Urbana, Champaign County, Ill.

1879-80.

CHAMPAIGN:
George Scroggs, Printer.

1880.

BOARD OF TRUSTEES.

[illegible] F MAY 7, 1878.

OFFICERS AND INSTRUCTORS.

FACULTY.

JOHN M. GREGORY, LL. D.,
Regent, and Professor of Philosophy and Political Science.

THOMAS J. BURRILL, M. A.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

DON CARLOS TAFT, M. A.,
Professor of Geology and Zoology.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of Ancient Languages, and Secretary.

HENRY A. WEBER, Ph. D.
Professor of Chemistry.

GEORGE E. MORROW, LL. B.,
Professor of Agriculture.

OFFICERS AND INSTRUCTORS.

*SELIM H. PEABODY, Ph. D.,
Professor of Mechanical Engineering and Physics.

MRS. LOUISA ALLEN GREGORY,
Professor of Domestic Science, and Preceptress.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

† FERNANDO A. PARSONS, M. L.,
Instructor in Book-Keeping.

PETER ROOS,
Professor of Industrial Art and Designing.

‡ MAJOR WILLIAM A. DINWIDDIE,
FIRST LIEUT. 2ND CAVALRY, U. S. A.,
Professor of Military Science and Tactics.

WILLIAM G. WOOD,
SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

IRA O. BAKER, C. E.,
Assistant Professor of Civil Engineering and Physics.

MELVILLE A. SCOVELL, M. S.,
Assistant Professor of Agricultural Chemistry.

CHARLES I. HAYS, B. S.,
Assistant in Horticulture and Botany.

*Resigned Feb. 1, 1880. † Resigned March 22, 1880. ‡ Relieved March 7, 1880.

CHARLES E. PICKARD, B. A.,
Assistant in English and Ancient Languages.

EDWIN L. LAWRENCE,
Head Farmer.

EDWIN E. KIMBALL,
Foreman of Machine Shop.

GEORGE A. WILD, B. S.,
Curator and Taxidermist.

CHARLES HILDEBRAND, Ph. B., M. E.,
Instructor in Right-line Drawing.

HENRY M. BEARDSLEY, B. L.,
First Assistant in Chemical Laboratory.

MRS. JENNIE HOLLISTER,
Teacher of Voice Culture and Singing.

MISS JENNIE C. MAHAN,
Teacher of Instrumental Music.

CHARLES C. BARNES,
Second Assistant in Chemical Laboratory.

NELSON S. SPENCER,
Foreman of Carpenter Shop.

LIST OF STUDENTS.

EXPLANATION.

The course of studies are indicated as follows: Ag'l, Agricultural; Hor., Horticultural; M. E., Mechanical Engineering; C. E., Civil Engineering; Min. E., Mining Engineering; Arch., Architecture; Nat. His., Natural History; Chem. Chemistry; L. & S., Literature and Science; Com., Commercial; Mil., Military; B. C., Builder's Course; D. S., Domestic Science. *Deficient in one or more studies.

RESIDENT GRADUATES.

Beardsley, Henry M .... Champaign
Stanton, S. Cecil .... London, England
Taft, Lorado .... Champaign
Mrs. Coddington, Alice .... Champaign
Miss Estep, Ida M .... Rantoul
Miss Falls, Ida .... Champaign
Miss Larned, Mary .... Champaign
Miss McAllister, Minnette C .... Champaign

SENIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Barrows, Charles S	M E	Woodstock
*Bills, Charles J	L & S & Mil	Garden Prairie
Bley, John C	M E & Mil	El Paso, Colorado
Briles, Byard S	Ag'l	Neoga
Cook, Charles F	Chem & Mil	Edwardsville
Groves, Charles W	L & S & Mil	Champaign
Hafner, Chris F	L & S & Mil	Oak Park
Harden, Edgar E	L & S & Mil	Dixon
Hatch, Frank W	L & S	English Prairie
*Heidenheimer, Benj	M E & Mil	Chicago
Jones, R D	L & S & Mil	Lacon
Kingsbury, C S	Elective	Bowensburg
Neely, Charles G	L & S	DuQuoin
Parker, W L	M E & Mil	Alton
Robinson, Albert F	Min E	Jacksonville
Robinson, Arthur S	M E & Mil	Jacksonville, Fla
Savage, George Marvin	L & S	Girard
Sondericker, Jerome	C E	Woodstock
Travis, William W	M E & Mil	Chenoa
White, Frank	C E & Mil	Stillman Valley

LADIES.

NAME.	COURSE.	RESIDENCE.
Bacon, Katharine I	L & S	Champaign
Batchelder, Augusta	D S	Harristown
Lucas, Cord:	L & S	Camargo
Parker, Minnie A	L & S	Decatur
Pearman, Ida	L & S	Champaign
Watson, Ella M	D S	DeKalb

JUNIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Allen, Jonas A	L & S	Elgin
Allison James G	L & S	McKinney, Texas
Armstrong, James E	Nat His	Seneca
Barnes, Charles C	Chem	Champaign
Beach, Bayard E	L & S	Champaign
Birney, Frank L	Chem	Urbana
Bootbby, Arthur	M E	Pitsfield
Brereton, J Edwin	L & S	Clement
Bullen, John L	Ag'l & Mil	Moline
*Coddington, Arch. O	L & S	Champaign
Cooper, Fred E	Chem	Girard
*Davis, A E	L & S	Salem
Dennis, Charles H	L & S & Mil	Decatur
*Doering, Otto L	L & S	Central City
Dressor, John C	Ag'l & Mil	Cottonwo'd Grove
Forsyth, James	Nat His	Springfield
Foster, Charles F	L & S	Curran
*Gaddis, John W	Arch	Olney
Hammett, Frank W	C E & Mil	Camargo
*Harrison, Samuel A	L & S & Mil	Alton
Hewins, Charles F	L & S	Loda
Hill, Frederick L	C E	Paxton
Hill, T Crawford	L & S & Mil	Tolono
Jones, Isaac	Chem & Mil	Sweetwater
Kauffman, Adam E	Chem & Mil	Sterling
Kingman, A H	Chem	Wakefield, Mass
Lowe, Augustus Y	L & S	Jerseyville
McKay, Francis M	L & S	Ottawa
Mansfield, Willis A	L & S	Marengo
Mason, William K	Ag'l	Buda
Miller, Harry A	Arch	Buffalo, N Y
*Miller, John H	Chem	Sheridan
Morse, John H	L & S & Mil	Cazenovia
Peadro, Benjamin F	L & S	Windsor
Pearman, J Ora	Chem	Champaign

NAME.	COURSE.	RESIDENCE.
*Pepoon, Herman S	Nat His	Warren
Pepoon, William A	Ag'l	Warren
Philbrick, Ethan	C E & Mil	Baileyville
Pletcher, Francis M	Nat His	Plattville
Porter, Frank H	L & S & Mil	Garden Prairie
Ross, Sprague D	L & S	Cottonwood
*Scoggin, Charles W	M E	Champaign
Schwartz, Joseph	Chem	Salem
*Seymour, Arthur B	Nat His	Camp Point
Slade, Byron A	Chem & Mil	Sycamore
Stull, Louis	L & S	Marengo
Sturman, James B	L & S	Dahlgren
Talbot, Arthur N	C E & Mil	Cortland
Weston, William S	L & S	Champaign
Williams, Frank H	M E & Mil	Moline
Wilkins, Harvey A	Arch	Champaign
Wilson, Maxwell B.	Ag'l	Paris

LADIES.

Baker, Kittie M	D S	Champaign
Barnes, Bertha E	L & S	Champaign
Carmack, Sarah E	D S	Camargo
Davis, Marietta	L & S	Monticello
Dresser, Gertrude E	L & S	Lindenwood
Elder, Loretta K	L & S	Mattoon
Elliott, Elsie C	D S	Tonica
Hammett, Jennie M	Nat His	Camargo
*Harmon, Ada D	L & S	Champaign
Lawhead, Lucie M	L & S	Champaign
Lawrence, Nettie E	D S	Champaign
Lucas, Anna B	L & S	Camargo
Macknet, Metta M Irene	L & S	Girard
*Mosser, Maggie	L & S	Decatur
Thomas, Darlie	L & S	Champaign
*Victor, Mamie Y	L & S	Champaign
Wright, Jessie A	L & S	Champaign

SOPHOMORE CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bacon, Theodore H	C E	Champaign
Boyd, Comma	Agl & Mil	Sheffield
Brady, Clarence E	L & S & Mil	Hardin
Bridge, Arthur M	L & S & Mil	LaMoile
Bringhurst, Henry W	C E	Logansport, Ind
Brown, Albert S	L & S	Champaign

NAME.	COURSE.	RESIDENCE.
Bellamy, Albert	L & S	Girard
Bullard, George W	Arch	Mechanicsburg
Bullard, Benjamin F	L & S	Mechanicsburg
Carman, Augustine S	L & S	Champaign
Carman, William B	Chem & Mil	Champaign
Cole, Edward E	L & S & Mil	Champaign
Cole, Haydn S	L & S & Mil	Kewanee
Conyne, William F	L & S	Warren
*Craig, William P	L & S	Champaign
Curtiss, William G	Agl	Warren
Denton, Gilbert H	C E	Sycamore
Drum, Henry	L & S	Girard
Eaton, William T	C E	Warrensburg
Eichberg, David	L & S & Mil	Atlanta
Eisenmeyer, Andrew J	M E & Mil	Trenton
French, George H	C E	Milton
*Garrett, James H	M E	Ashton
*Gillette, Leslie B	L & S	Buffalo
Hartman, Ferris L	L & S	Chicago
Hogg, James O	Arch	Hannibal, Mo
Huey, Joseph D	Nat His	Clement
Little, H P T	Chem*	Champaign
Maltby, Frank B	M E	Champaign
Merritt, Charles H	Nat His	Waterman
Mohr, Louis	M E & Mil	Chicago
Neely, John R	L & S & Mil	Du Quoin
*Noble, Thomas	Chem	Todd's Point
Orr, Robert E	C E & Mil	Champaign
Peabody, Arthur	Arch	Champaign
Palmer, Charles W	L & S	Watseka
Reed, Howard	Agl & Mil	Galesburg
*Rice, George H	C E	Arlington
Richards, George W	Min E & Mil	Quincy
Roberts, Charles N	M E	Jefferson
Rugg, Frederick D	L & S	Champaign
Sharp, Abia J	M E & Mil	East Lynne, Mo
Schlaudeman, Frank	M E	Decatur
Slauson, Howard	L & S	Dwight
Smith, Charles L	L & S & Mil	Champaign
Sparks, Charles F	Chem	Alton
Stevenson, Alexander C	Agl	Greencastle, Ind
Stillwell, Homer A	L & S	Urbana
Taft, Florizel A	Nat His & Mil	Champaign
Todd, James	M E	Elgin
Turner, Herbert	Nat His & Mil	Quincy
Wadsworth, John G	L & S & Mil	Madison, Dak
Williams, Alfred H	Nat His	Moline

LADIES.

NAME.	COURSE.	RESIDENCE.
Andrus, Dora A	L & S	Ashton
Avery, Kittie Clyde	L & S	Champaign
Brown, Lois M	L & S	Elmwood
Coddington, Ella M	L & S	Champaign
Cole, Fronia R	D S	Champaign
Hammond, May E	Chem	Ludlow
Little, L Belle	L & S	Champaign

FRESHMAN CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, William L	Com	Union Grove
Alling, Charles A	C E	Champaign
Allison, John W	L & S	Bismark
Angell, George H	M E	Elkhart, Ind
Armstrong, Charles G	Chem	Seneca
Atkinson, Frank E	C E	Harrison
Bailey, Samuel G Jr	Chem	Chicago
Bogardus, Edward F	Elective	Champaign
Bogardus, Charles E	Chem	Champaign
Brainard, Clarence	C E	Buda
Burt, Frank S	L & S	Urbana
Christie, George M	Min E	Atlanta
Claflin, Charles H	M E	Indianapolis, Ind
Coe, Decius Octavius	L & S	Rock Falls
Constant, Robert F	Chem	Buffalo Hart
Davis, Rufus J	L & S	Salem
Davis, Jephtha H	L & S	Monticello
Diffenbaugh, Henry	L & S	Dwight
Donovan, John L Jr	L & S	Watseka
Dougherty, M L	L & S	Mason City
Durfee, Elisha B	L & S	Marion
Ells, Charles S	M E	Champaign
Gates, Alphonso S	C E	Hamilton
Goltra, W F	C E	Bourbonnais Grove
Gray, Nelson A	L & S	Champaign
Gregory, Grant	L & S	Champaign
Haven, Dwight C	C E	New Lenox
Hazlit, John	Nat His	Marengo
Heath, William A	L & S	Champaign
Hewes, George C	Chem	Urbana
Hubbell, Charles S	C E	Altona
Hudgens, Dana	Arch	Sandwich
Huntley, Converse R	Chem	De Kalb

NAME.	COURSE.	RESIDENCE.
Kelso, Elmer L	Chem	Paxton
Kemman, Alphonso H	Ag'l	La Grange
Kenower, John T	Phar	Clement
Kimmel, Daniel L	L & S	Elkville
Kneussl, Otto	M E	Ottawa
Lathrop, John C B	Arch	Belvidere
Leslie, George L	Nat His	Princeton
Lewis, Ralph D	Hor	Champaign
Magoon, William H	L & S	Champaign
McCune, H L	L & S	Ipava
Moore, William D		Chatham
Moore, George L		Chatham
Norris, William L	Ag'l	Arlington
North, Foster	Nat His	Kewanee
Nungesser, John	Chem	Mascoutah
Nye, Charles C	Ag'l	Decatur
Owens, Joseph D	Chem	Urbana
Page, A J		
Palmer, Charles E	C E	Nashville
Peck, John A	L & S	St Louis Mo
Piatt, Silas H	Ag'l	Monticello
Porter, Edward K	Chem	Salem
Postel, Julius	L & S	Mascoutah
Read, Harry J	C E	Chicago
Sawyer, William W	Chem	Paxton
Scotchbrook, George P	C E	Morrison
Shallenberger, Ashton C	L & S	Toulon
Singer, William A	Chem	Peoria
Slauson, Howard	L & S	Dwight
Sondericker, William	L & S	Woodstock
Spencer, Nelson S	Arch	Dixon
Stevenson, Archy A	M E	Rock Island
Swasey, Edward H	L & S	Belvidere
Thayer, George H	C E	Winnebago
Tinkham, Michæl D C	Chem	Homer
Trenary, Jasper M	Chem	Urbana
Wallace, Joseph D	M E	Champaign
Warrington, James N	M E	Chicago
Weis, Joseph	Chem	Tonica
Wheeler, John C	L & S	Plano
Whitmire, James H	L & S	Metamora
Whitmore, Jesse K	M E	Dixon

LADIES.

NAME.	COURSE.	RESIDENCE.
Anderson, Ida V	L & S	Champaign
Ashby, Lida M	L & S	Champaign
Barber, Minnie W	D S	Champaign
Cadwell, Eliza A	L & S	Utica

NAME.	COURSE.	RESIDENCE.
Cadwell, Julia E	L & S	Utica
Campbell, Juniata G	L & S	Polo
Carman, Ellen M	L & S	Champaign
Conkling, Anna J	L & S	Champaign
Coddington, Hester	L & S	Champaign
Colvin, Mary S	D S	Mt Palatine
Everett, M Kate	Com	Champaign
Fellows, Clara B	L & S	Farmer City
Gardner, Jessie	L & S	Champaign
Healey, Grace	L & S	Champaign
Hester, Elvira	L & S	St Joseph
Howell, Lemira H	D S	Champaign
Johnson, J G	Elective	Urbana
Knowlton, Lizzie A	L & S	Urbana
Langley, M Celeste	L & S	Champaign
Lewis, C Florence	L & S	Farmer City
Maltby, Helen E	L & S	Champaign
McNeil, Mary A	D S	Pickneyville
Moore, Clara Belle	L & S	Champaign
Raley, Arvilla K	L & S	Granville
Reed, E May	D S	Urbana
Stewart, Ella M	D S	Champaign
Smith, Laura Belle	L & S	Champaign
Wardall, Fannie M	D S	Tolono
Wright, Minnie E	L & S	Champaign

PREPARATORY CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Aherin, Thomas	L & S	Girard
Allen, Edwin Wright		Harristown
Andrews, William T	M E	Chicago
Ayers, Judson F		Urbana
Adams, Edwin F	Chem	Dwight
Barry, John D	Ag'l	Alton
Bates, Woodville	L & S	Bellefontaine, Mo
Blackburn, Milton A	Ag'l	Paris
Bowen, Aaron L	M E	Savannah
Bunn, Henry C		Bloomington
Baner, Frank A	C E	Mason City
Barmm, Charles E	M E	Chicago
Blakeslee, Clarence E	M E	Du Quoin
Boller, Chester E	Arch	Lexington
Bowman, Richard H	Chem	Champaign
Bills, Frank S	L & S	Garden Prairie
Bing, Louis S	Com	Urbana

NAME.	COURSE.	RESIDENCE.
Brinkmann, Edward	Chem	Edwardsville
Brown, George M	M E	Dixon
Buckworth, Dana L		Le Roy
Burt, Angelo R	M E	Dubuque, Iowa
Carter, Harry L		Humboldt
Casey, Samuel	L & S	Mt Vernon
Clark, E H	L & S	Sadorus
Cole, T E	L & S	Champaign
Collins, T B		
Cornell, Henry M	Com	Champaign
Davis, Harry G		Davis Junction
Dole, Charles E	C E	Mattoon
Dolph, Isaac N	M E	Champaign
Dorsey, Richard E	L & S	Gillespie
Dustin, William		Lincoln
Estabrook, Louis K	C E	Atlanta
Earle, Charles T	Chem	Cobden
Eberlein, Frederick W	Chem	Champaign
•Eyman, Isaac R	Ag'l	Belleville
Ferguson, Charles W	M E	Rockford
Fitch, Edward	L & S	Albion
Foster, Eugene E		Curran
Fuller, Victor G	L & S	Toulon
Goodsmith, W P	Chem	Chicago
Gray, Basil S	Com	Vienna
Hoxie, John B	L & S	Tonica
Haas, Solomon I	Arch	Savanna
Halberstadt, D E		
Hatch, Henry D	L & S	Plainfield
Hennan, David	C E	Highland
Hibbard, Henry P	M E	Alton
Howard, Homer D	L & S	Le Roy
Inman, Ira F	Phar	Anna
Jackson, Samuel A	Com	Vienna
James, Justin C		Mattoon
James, F Porter		Mattoon
Johnston, John	Elective	Carlyle
Keith, Albert J	Arch	Paxton
Keenan, Arthur J	Com	Le Roy
King, D S		
Kirk, James B	M E	Faribault, Minn
Lawrence, Philip E	L & S	Galesburg
Lavely, John A	L & S	N Bethlehem, Pa
Mansfield, John R	Com	Greenwood
McBroom, Alexander	Elective	Geneseo
McClaughry, Charles C	M E	Joliet
McCluer, George M	Elective	Farina
McClure, Charles E	C E	Mattoon
McCoy, Joseph S		French Grove
McDowell, Malcolm Jr	Chem	Chicago

NAME.	COURSE.	RESIDENCE.
McFall, Howard M	Chem	Mattoon
McEathron, William J	C E	Lena
McIlduff, Thomas E	Com	Dwight
Miller, John A		Buffalo N Y
Montezuma, Charles	L & S	Urbana
Morrison, Edgar G	Elective	Taylorville
Mortland, John F	L & S	Hardin
Minis, Andrew C		Parkville
Nelson, Harry A	M E	Aneida
Norman, Charles C	Elective	Carlyle
Primm, James L Jr	Ag'l	Pickneyville
Page, Milo K	Chem	Metamora
Palmer, Arthur W	Chem	Springfield
Peart, George K	C E	Braidwood
Philbrick, Solon	L & S	Baileyville
Porterfield, Melvin W	L & S	Mt Erie
Powers, Eugene A	Chem	Olney
Randolph, Thurston F		Canton
Rea, Frederic S	L & S	Urbana
Rollins, G Edward	Chem	Kewanee
Secrest, Daniel C	M E	Watseka
Smalley, Francis A	L & S	Girard
Shaw, Alvin A	L & S	Annawan
Smith, E E	Ag'l	Davis
Smith, Henry O	Nat His	Yorkville
Smith, Frank L	Com	Morrison
Smith, Tracy A	Elective	Wilmington
Speidel, Ernst	Chem	Rock Island
Spencer, Howard M		Dixon
St Vrain, Savinien	Com	Chester
Thomas, E A	L & S	Pleasant Valley
Tennant, George B	L & S	Chicago
Thomas, Harry C	Com	Malta, Ohio
Vial, Edmund R	Ag'l	Western Springs
Wade, Harry M	L & S	Watseka
Whitman, Marcus F	C E	Como
Womacks, Wilson E	L & S	Champaign
Watson, William S	L & S	Ludlow
Whitmore, Jervis J		Springfield, Vt
Wilcox, Alfred R	L & S	Minonk
Wright, Robert W	L & S	Belvidere
Woodrow, Charles N	Ag'l	Green Valley

LADIES.

Babb, Nellie E	L & S	Champaign
Bailbache, Adaline	Elective	Washington, D C
Carmack, Mary E	D S	Camargo
Castle, Clara A		Ridge Farm
Castle, Lucy		Ridge Farm

NAME.	COURSE.	RESIDENCE.
Clark, Lucy J		Champaign
Ellis, Lola D		Canton
Hubbart, Mary F	L & S	Monticello
Hewelt, Rose E	Com	Irvington
Krause, Josephine		Chicago
Lufkin, Adele	Com	Anna
Lowry, Susie F		Monticello
McLean, Susie E		
Morris, Ida M		Pesotum
O'Brien, Mary		Groveland
Ross, Della	L & S	Avon
Randolph, Flora F		Canton
Romine, Lou		Champaign
Scoggin, M Alice	L & S	Champaign
Wells, Anna L	Elective	Western Springs
Williams, Ella	L & S	Monticello
Wilson, Rachel S	D S	Paris

SPECIAL STUDENTS.

AGRICULTURE.

Booth, J. McR .... Claytonville Mo.
Brenneman, Edward .... Peru.
Dressor, James R .... Cottonwood.
Ramsay, George H .... Trenton.
Smith, Henry P .... Edwardsville.

CHEMISTRY.

Cutter, Cyrus H .... Oswego.
Simpson, W. C .... Vienna.
Chamberlain, Miss A. E .... Milwaukee, Wis.

DRAWING AND PAINTING.

Chase, M. E .... Champaign.
Hunter, C. R .... De Kalb.
Ray, Victor .... Urbana.
Miss Dunlap, L .... Savoy.
Miss Hopkins, A. K .... De Kalb.
Miss Peabody, Kate F .... Champaign.
Mrs. Hays, C. I .... Champaign.
Mrs. Ricker, N. C .... Urbana.

MUSIC.

Clark, Minnie	Sadorus.
Conkle, Maggie	Urbana.
Erwin, Ella	Camargo.
Gibson, Emily	Champaign.
Hammond, Ida	Champaign.
Hollister, Minnie	Urbana.
Hollister, Mrs. Flora	Urbana.
Hollister, Mrs. H	Urbana.
Hollister, Frankie	Urbana.
Hinkle, Mrs. V	Bondville.
Irwin, Ella	Camargo.
Kaucher, Kate	Urbana.
Kennedy, C. Dell	Champaign.
Loucks, Lydia F	Tolono.
Morse, Hattie	Gifford.
Moury, Aggie	Philo.
Peadro, Laura	Windsor.
Rea, Fannie	Urbana.
Weaver, Kate	Urbana.
Webb, Amie	Urbana.

SUMMARY.

Resident Graduates	Gentlemen	3	
	Ladies	5	8
Seniors	Gentlemen	20	
	Ladies	6	26
Juniors	Gentlemen	53	
	Ladies	17	70
Sophomores	Gentlemen	52	
	Ladies	7	59
Freshmen	Gentlemen	75	
	Ladies	29	104
Preparatory	Gentlemen	109	
	Ladies	22	131
Special	Gentlemen	10	
	Ladies	26	36
Total			434

Illinois Industrial University.

HISTORY.

The Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign County in bonds, buildings, and farms. The State has also made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main Building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and Schools have been added as required, till four Colleges, including twelve distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1485. The number graduated from the several Colleges, including the class of 1879, is 227. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a fine Art Gallery was established. In 1876 the University received from the centennial exposition at Philadelphia, three diplomas and a medal. In 1878 its exhibit at the Paris International Exposition gained the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central railroad and the Indiana, Bloomington and Western railway. The county is a region of beautiful rolling prairies,

with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments embraces about 623 acres, including stock farm, experimental farm, orchards, gardens, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building for public use, one large and two small Dormitory Buildings, a spacious Mechanical Building and Drill hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, three dwellings, two large barns, and an ample Green-house.

The Mechanical Building and Drill Hall is of brick, 126 feet in length and 88 feet in width. It contains a boiler, forge and tank room; a Machine Shop, furnished for practical use, with a steam engine, lathes, and other machinery; a pattern and finishing shop, shops for carpentry and cabinet work, furnished with wood-working machinery; paint and draughting-rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry, or a section of a battery of field artillery. It is also well supplied with gymnastic apparatus. One of the towers contains an armorer's shop and military model room, an artillery room and a band room. The other contains a printing office and editor's room.

The large Dormitory Building is 125 feet in length and five stories in height. It affords 80 private rooms for students. Two smaller Dormitory Buildings contain eight rooms each. The new Chemical Building, erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $470,000, the University owns 25,000 acres of well-selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and County bonds amounting to $319,000, besides other property and avails, valued at $33,000. The State has appropriated $25,000 to the Agricultural Department for barns, tools, stock, etc.; $25,000 to the Horticultural Department for

green-house, barns, drainage, tools, trees, etc.; $25,000 for Mechanical and Military Building, machinery, etc.; $127,000 toward the erection of the Main Building, and furnishing the same; $10,500 for Chemical Apparatus; $25,000 for Library; $5,000 for the Apparatus of a Physical Laboratory; $3,000 for a Veterinary Hall, Stable and Apparatus; $40,000 for Chemical Building; besides smaller amounts for agricultural experiments, etc.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich and equalled at few, if any, of the Colleges of the west. Among these collections are included the following:

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles and mammals, from the oldest paleozoic time to the present. Also a fine set of fossils obtained from Germany, besides collections of fossils of this and other States, well illustrating the different formations, and suitably arranged for practical study.

Conchology.—A large collection of shells fully illustrating the principles of conchology, as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals, with the single exception of the order of proboscidea; also typical representatives of the amphibious reptiles and fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivors and fur bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is very large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders, and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants, indigenous to Illinois, including nearly complete

sets of the grasses and sedges. There are besides many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc.

A collection of wood specimens from two hundred species of North American trees, well illustrates the variety of native wood. The trees and shrubs of Stephenson County, Illinois, are represented by another collection.

Plaster casts of fruits represent many of the leading varieties. as well as interesting specimens, showing peculiarities of growth, effects of cross fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized, with which, and a complete set of imported models. Crystallography is fully illustrated.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; samples of some hundreds of varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; cast of ancient plows; engravings, lithographs and photographs of typical animals of noted breeds.

The Farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, costing over $5,000, and illustrating the subjects of Mechanics, Pneumatics, Optics, Heat and Electricity. Ample facilities are afforded to the students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

The Mechanical Laboratory is provided with a Steam Engine, Engine and hand lathes, planer, drill presses, and the

requisite hand tools, benches, vices, anvils, etc., for pattern shop, blacksmith shop, moulding room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work shops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, at a cost of $2,000, illustrating sections of mines, machinery for elevating and breaking ores, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In Sculpture. it embraces thirteen full size casts of celebrated Statues, including the Laocoon Group, the Venus of Milo, etc. Forty Statues of reduced size and a large number of Busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large Autotypes, Photographs and fine Engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a Gallery of Historical Portraits, mostly large French Lithographs of peculiar fineness, copied from the great National Portrait Galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 12,000 volumes, and additions are being made every year. During the year ending June 1, 1880, over 600 volumes have been added and an equal increase may be expected the coming year.

The large Library hall, fitted up as a reading room, is open throughout the day for study, reading and consultation of authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study encouraged or required. The reading-room is

well provided with American, English, French, and German, papers and periodicals, embracing some of the most important scientific and art publications. The following periodicals are regularly received:

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Rural New Yorker.
Country Gentleman.
New England Farmer.
American Dairyman.
California Farmer.
Land and Home.
Practical Farmer.
Farmer and Fruit Grower.
Agricultural Gazette, *London.*
Gardner's Chronicle, *London.*
Journal d'Agriculture Pratique, *Paris.*
Revue Horticole, *Paris.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal.
Horticulturist.
Western Farmer.
Wallace's Monthly.
Farmers' Review.
Veterinarian, *London.*
Recueil de Medicine Veterinaire, *Paris.*

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Engineering, *London.*
Building News, *London.*
Builder, *London.*
Skizzen-buch, *Berlin.*
Scientific American.
Engineering News.
Engineering and Mining Journal.
Scientific American Supplement.
VanNostrand's Engineering Magazine.
The Workshop.
American Architect.
Western Manufacturer.
Gazette of Patent Office.

SCIENTIFIC.

Annales des Sciences Naturelles, *Paris.*
Nature, *London.*
Grevillea, *London.*
Comptes Rendus, *Paris.*
Chemical News, *London.*
American Journal of Chemistry.
Polytechnisches Journal, *Augsburg.*
Jahrbericht der Cheme, *Giessen.*
Annalen der Chemie, *Leipsic.*
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Sanitarian.
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
Quarterly Journal of Microscopal Science.
American Journal of Science and Art.
American Naturalist.
Journal of Franklin Institute.
Mathematical Quarterly.

LITERARY AND NEWS.

New Englander.
International Review.
Edinburg Review.
London Quarterly Review.
British Quarterly Review.
North American Review.
Atlantic Monthly.
Scribner's Monthly.
Library Journal.
Literary World.
American Journal of Education.
Magazine of American History.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Princeton Review.
United Service Magazine.
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign Union.
Champaign Times.
Danville News.
The Watchman, *Boston.*
Paxton Record.
Chicago Weekly Journal.

The exchanges of the *Illini*, over thirty in number, are also free to Students in the Library.

AIMS OF THE UNIVERSITY.

The University being both State and National in origin, its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress*, 1862. *Sec.* 4.

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly*, 1867, *Sec.* 7.

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges,

which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped under the same College. The following are the Colleges and Schools :

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.

School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

School of Domestic Science.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages. School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, Elocution, Telegraphing and Photography are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

It has been a favorite aim of the University from the outset, to allow as much freedom as possible in the selection of studies.

A University is designed not for children, but for men and women, who may claim to know something of their wants, powers and tastes. It is not useful to require every student, without regard to his capacity or practical wants, to take entire some lengthened "course of study." Each student should weigh carefully his own powers and needs and counsel freely with his teachers as to

the branches he may need to fit him for his chosen career, and then should pursue them with earnestness and perseverance, without faltering or fickleness.

It is necessarily required, 1st. That the student shall be thoroughly prepared to enter and keep pace with the classes in the chosen studies; and 2nd, That he shall take these studies in the terms in which they are taught; 3rd, Candidates for a degree must take the course of studies prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies can be made after the beginning of a term, without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physical Geography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and Designing, Elements of Construction, Graphical Statics, History and Aesthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, Domestic Science and Political Economy.

4

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, the day previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, Book-Keeping, single and double entry; English Rhetoric and Composition. These are required additional to 1 and 2 for candidates for the Colleges of Agriculture, Engineering and Natural Science.

4. Physiology, Botany, Natural Philosophy and Latin Grammar and Reader. Cæsar, Cicero and Virgil, Latin Prose, additional to 1 and 2 for School of English and Modern Languages.

5. Latin (as in 4) and Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, additional to 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also "*Preliminary Year.*"

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

COUNTY SUPERINTENDENT'S CERTIFICATES.

County Superintendents of Schools will be furnished with questions and instructions for the examinations of candidates in the four common branches, Arithmetic, Geography, English Grammar and History of the United States; those who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the Preliminary Classes.

COLLEGE OF AGRICULTURE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean.
PROFESSOR BURRILL,
PROFESSOR PRENTICE.
PROFESSOR SCOVELL,

C. I. HAYS.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different

crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly, all that man can know about soils and seeds, plants and animals, and the influences of light, heat and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming—of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment and can not be regarded as an unfit end of a sound collegiate training.

The steady aim of the trustees has been to give to the College of Agriculture the largest development practicable, and to meet the full demand for Agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are mainly taught by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, &c.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm; its improvement by mechanical means, as Drainage

and Irrigation; its Divisions, Fences, Hedges, etc.; its Water Supply; the construction of Roads; arrangement, planning and construction of Farm Buildings; the construction, selection, care, and use of Farm Implements and Machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy—Relations of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc., farm accounts.

History of Agriculture—Progress and present condition in this and other countries. Influence of Climate, Civilization and Legislation in advancing or retarding. Agricultural Literature and Organizations.

Rural Law.—Business Law; Laws especially affecting Agriculture—tenures of Real Estate; Road, Fence, Drainage Laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: Orchard Sites, the Age of Trees to Plant, the Season to Plant, How to Plant, What to Plant, the Management of the Soil, Pruning and Care of Trees, Gathering and Preserving Fruit. Diseases and Injuries, the Nursery, Ornamental Trees and Shrubs, Flower Gardens, Vegetable Gardens, including Propagating Beds and Houses, the Vineyard and Small Fruits, and Timber Tree Plantations. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and styles, the kinds and uses of trees, shrubs, grass and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating position of all prominent objects, including the kinds and groups of trees and other plants. These plans with specifications, are to be deposited in the library of the College. Excursions are made when found practicable for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for specially horticultural pursuits and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and care of plants requiring various treatments. Insects and diseases with the remedies are thoroughly treated, and the means of securing vigor of growth, or abundance of flowers, are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is also had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification put to practical test. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Pruning and training by various methods, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students also study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Plant Houses and Management.—This study includes garden and landscape architecture, the methods of construction, heating and ventilation and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the Domestic Animals is

taught by lectures, demonstrations and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the Principles and Practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are also given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the Agricultural course will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery. Veterinary Medicines; their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

Laboratory Work.—Experiments and Special Investigations by each student. A *Thesis* is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology and Meteorology, see statements in College of Natural Science.

APPARATUS.

The College has for the illustration of practical agriculture, Stock Farm of 410 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has also fine specimens of neat cattle, Short-Horns and Jerseys. Also several breeds of swine, to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes also experiments in agriculture and horticulture, under the direction of the Professors of Agriculture and of Horticulture and of the Farm Superintendent, and experiments

in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several State Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The Barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The Barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a mill for grinding feed, run by a large wind-mill.

A Veterinary Hall and Stable has been provided, and a Clinic is held to illustrate the lectures on Veterinary Science. The department has Dr. Auzoux' celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and teeth of the horse at different ages.

Surveying and Drainage are illustrated by field practice, with instruments, and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College also has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts, and other apparatus, including a large number of models of agricultural machinery from the Patent Office.

Upon the grounds devoted to the use of the College, there are: 1. A very large specimen apple orchard planted in 1869, and containing above 1,000 varieties,—many varieties of pears, cherries, grapes and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and now containing nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawn and beds of flowers and foliage plants, walks of different material and styles of laying out, give illustration to the class-room work in landscape gardening. A spacious green-house, recently much enlarged, contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S. in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture, Chemistry, Trigonometry, ~~Algebra and Adv.~~ Geometry, Shop Practice (optional).
2. Elements of Horticulture, Chemistry, American Authors, or Free Hand Drawing.
3. Vegetable Physiology, Chemistry, Rhetoric.

SECOND YEAR.

1. Agricultural Chemistry, (Soils and Plants), Botany, German.
2. Agricultural Chemistry (Tillage, Fertilizers, Foods), Botany, German.
3. Economic Entomology, Zoology, German.

THIRD YEAR.

1. Agricultural Engineering and Architecture, Animal Anatomy and Physiology, Geology or Ancient History.
2. Animal Husbandry, Veterinary Science, Physics or Mediæval History.
3. Landscape Gardening, Veterinary Science, Physics or Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography, Mental Science, History of Civilization.
2. Rural Economy, Constitutional History, Logic.
3. History of Agriculture and Rural Law, Political Economy, Laboratory Work. Graduating Thesis.

N. B.—Students in Horticulture will take the special branches in Horticulture described on page 30.

FARMER'S COURSE.

Students who cannot give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year. The studies of the second or winter term of this course are arranged so as to be profitably studied by those who can be in attendance only during that term. Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age. The studies are taught in the following order :

1. Elements of Agriculture, Agricultural Engineering and Architecture, Animal Anatomy and Physiology, Shop Practice.
2. Animal Husbandry, Rural Economy, Veterinary Science.
3. History of Agriculture and Rural Law, Veterinary Science, Practical Entomology or Landscape Gardening.

COLLEGE OF ENGINEERING.

SPECIAL FACULTY.

The REGENT,

Professor RICKER, Dean.
Professor SHATTUCK,
Professor PEABODY,
Professor WEBER,
Professor BAKER,
Professor ROOS,

CHARLES HILDEBRAND.

SCHOOLS.

Mechanical Engineering, Architecture,
Civil and Mining Engineering.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their courses more extensive and profitable. The following suggestions are offered to such as wish to make thorough work: French and German, are pursued at least one year each. Some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text-book, and the drawings made on smooth paper, eight by ten inches.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College Exercises:

For manuscript and unimportant drawings, a heavy flat-cap paper. For ordinary drawings, not colored, a heavy, first quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings. and lettering, the best three-sheet Bristol board.

For Problems, Exercises, Vacation Journals, Lecture Notes, Theses and other Manuscripts, and for Geometrical Projection, Topographical, Railroad, Typographical and Construction Drawings, paper 8x11½ inches, the size of the plate being 8x10 with 1½ added for binding. If Bristol board is used it must be cut 8x10 inches, and the binding margin hinged on with muslin.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labeled with the donors' names and placed in the cabinets of the College for the inspection of students, and the illustration of lectures.

THESES.

In all the schools of this College a Thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. The student must be prepared to explain and defend it before his class. It must be illustrated with such photographs, drawings and sketches as may be needed, and embellished with a title page neatly designed and printed with India ink, or colors. It must be upon Regulation Paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course. after which it will be deposited in the Library of the University.

These papers, and also the practical exercises mentioned in each course, will be credited upon the diploma, and no course of the College will be accounted complete without them.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the Profession of Mechanical Engineering. It aims to fit them to invent, design, construct and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory, is counted as one of the studies of the course.

In PRINCIPLES, instruction is imparted by lectures, illustrated plates and by text books. Examples are also given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In PRACTICE, elementary forms are produced and Projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In DESIGNING, the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

INSTRUCTION IN MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, the object of which is to familiarize the student with the forms of the parts of machines, and the mode of producing them He is made familiar with all the ordinary cutting tools for iron and wood ; the form and condition for most effective work ; the machines and appliances by which they are put into action. and the instruments by which desired dimensions of product are

obtained. This practice is carried on in the Mechanical Laboratory, and represents five different shops, viz:

1—Pattern Making.

2—Blacksmithing.

3—Moulding and Founding.

4—Bench Work for Iron.

5—Machine Tool Work for Iron.

In the 1st, the practice consists of planing, turning, chiseling, etc., in producing true surfaces of various forms in wood, and also of combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, several pieces are moulded in sand and cast, some of which are useful in the succeeding shops.

In the 4th, there is first a course of free-hand bench work, where the cold-chisel and file are the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

The 5th shop involves the use of the ordinary machine tools of the machine shop. The first practice employs these machines with their cutting tools or bits, in the common operations, such as turning cylinders, disks, grooves and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced. Polishing and finishing of surfaces are also practiced.

Lectures are given in which the most favorable forms and manipulation of cutting tools and auxiliary appliances are explained.

Previous to the shop work, the pieces are drawn by the stu-

dent, and the exact thing to be done is indicated, thus avoiding mistakes, and facilitating practice.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This practice in designing and drawing is a leading feature in the course of instruction.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation. The following is a detailed view:

PURE MATHEMATICS.

Advanced Geometry.—Applications of Algebra to Geometry; Transversals; Harmonic Proportions, etc. *Trigonometry.*—Analytical and Plane. Relations between the functions of an arc: Formation and use of Tables; Solution of plane triangles. *Analytical Geometry.*—Construction of equations; Discussion, in a plane, of the point, right-line, circle, ellipse, parabola and hyperbola; Higher plane curves, cycloid, cissoid of Diocles, etc.—*Differential Calculus.*—Differentials of algebraic and transcendental functions; Maclaurin's Theorem; Taylor's Theorem; Maxima and Minima of functions of one variable; Equations of tangents, normals, sub-tangents, sub-normals, etc.; Differentials of lines, surfaces of volumes. *Integral Calculus.*—Integration of elementary forms and of rational fractions; Rectification of plane curves; Quadrature of plane areas and surfaces of revolution; and Cubature of solids of revolution.

SECOND YEAR.

Advanced Algebra.—Binomial Theorem; Properties and summation of series. Exponential quantities, Logarithms. General theory and methods of solving equations. *Analytical Geometry.*—Loci in space; Surfaces of the second order. *Differential Calculus.*—Differentials and Maxima and Minima of functions of two or more variables; Osculatory curves; Radius of curvature;

Evolutes, involutes and envelopes; Discussion of algebraic and transcendental curves and surfaces; Tangent and normal planes; Partial differentials of surfaces and volumes. *Integral Calculus.*—Integration of transcendental and irrational differentials; Differentials of higher orders; Differential equations; Rectifications, quadrature and cubature in general. *Spherical Trigonometry.*—General Formulas; Solution of Spherical Triangles. *Calculus of Variations* will be taught to advanced students.

PHYSICS.

The course in Physics is complete and thorough, embracing the four kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is amply provided with illustrative apparatus for use in the lecture-room, and an extensive Physical Laboratory. The collection of instruments, costing over $5,000, embraces Acoustic apparatus from R. Koenig, of Paris; apparatus for Heat and Molecular physics from J. Salleron, of Paris; for Light, Optics and Electricity from Stoehrer, of Leipsic, and Browning and Newton, of London; Pneumatic and Electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the Mechanical Shops of the University. It includes, also, Browning's Electric Lamp; and from Eliot Bros., London, Resistance Coils, Galvanometers, etc., for higher researches in Electricity.

TECHNICAL STUDIES.

Cinematics, and Principles of Mechanism.—Relative Motion of points in a system of connected pieces; Motion independent of Force; Velocity ratio; Investigation of motion of elementary parts of machines, as Friction and Noncircular Wheels in rolling

contact, Cams and Curves in sliding contact; Correct-working Gear Teeth; Gearing Chains; Escapements; Link-Work.

Analytical Mechanics.—Equations of Equilibrium; Moments; Virtual Velocities; Centers of Gravity; Mechanical Powers; Friction; Dynamics.

Hydraulics.—Amount and Center of Pressure upon submerged surfaces; Flow of Liquids through Orifices, Weirs, Pipes and Channels; Distribution of water in cities. Forms and arrangement of orifices for fountains.

Thermodynamics.—The Laws and complete Theory of Thermodynamics as required in the study of all kinds of heat engines, including the deportment of perfect gases during expansion, and also steam and other fluids not perfect gases; action of heat in changes of state, and in confined fluids.

Resistance of Materials.—See School of Civil Engineering.

Prime Movers.—The theory and useful effects of Turbine Water-wheels, and best form of the parts for high efficiency. Other Water-wheels and Wind-wheels. Application of Thermodynamics in the study of Heat Engines. Relative Economy of different engines.

Mill-work and Machinery.—Trains of Mechanism, studied with reference to their Resistance and Efficiency. Best forms for transmission of power for short and great distances. Forms of the parts for securing desired results in power and velocity; Elastic and ultimate strength of parts.

DRAWING.

Projection Drawing.—Use of Instruments in applying the Elements of descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades and Shadows; Perspective.

Free-Hand Drawing.—Sketches of Machinery; Ornamentation; Lettering.

Machine Drawing.—Working Drawings of Original Designs; Finishing in Water Colors, and in Line-shading; Details for Shop Use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The Shop Practice of the first year has already been described. The second year practice will have for its object the production

of some model or machine. The students under the immediate direction of teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, reduce them to neat and accurate working drawings and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require executions in iron, brass and wood, for the purpose of giving breadth of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the Mechanical Engineer carries his designs into execution, and teaches him to so shape, proportion and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the Commercial work which is undertaken by the shop For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of Prime Movers and other machines, are undertaken by each student. They take Indicator Diagrams from the engine of the Mechanical Laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the defects of valve movement in distribution of steam.

In strength of materials the student determines the modulus of rupture and coefficient of elasticity of about six kinds of building material. In Hydraulics the flow of water through orifices of different form are studied experimentally. In Mechanism each student works out and reports on an original problem involving mechanical movements.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own

manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the Cabinet.

The State has provided a large Mechanical Laboratory and Workshop.

The Pattern Shop is furnished with complete sets of tools, benches and vises for Pattern-makers. In a separate building are forges, a moulder's bench with sand, and brass and iron furnaces sufficient for the castings ordinarily required. Additional sets of tools are provided for the special use of students in the shop-practice classes.

MECHANICAL ENGINEERING COURSE.

Required for Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. ~~Plane~~ Trigonometry, ~~Algebra and~~ Adv. ~~Geometry~~; Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Free Hand Drawing, Shop Practice; French.

SECOND YEAR.

1. Designing and Construction of Machines; Advanced Algebra ~~and Analytical~~ Geometry; German.
2. ~~Advanced Calculus~~; Designing and Construction of Machines; German.
3. Advanced Calculus; Astronomy; German.

adv Analyt Geom.

THIRD YEAR.

1. Mechanism and Mechanical Laboratory; Advanced Descriptive Geometry; Chemistry and Laboratory Practice.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Modern History; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geology; Mental Science.
2. Prime Movers; Constitutional History; Construction Drawing.
3. Mill Work; Designing and Laboratory Practice; Political Economy; Graduating Thesis.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The School is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable students to enter intelligently upon the various and important duties of the Engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to Civil Engineering are not introduced until the second year.

The instruction is given by lectures, text-books and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete Course occupies four years. The tabular view shows the arrangement of the subjects. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for the higher engineering operations, such as making geodectic surveys, building arches, trussel bridges and supporting frames of all kinds.

Each year consists of thirty-six working weeks, divided into Fall, Winter and Spring Terms. The four years are divided among the different branches nearly as follows: Languages, 360 recitations; Pure Mathematics, 360 recitations; Drawing of all kinds, 360 hours; Lectures with Mathematical Analysis, 200 hours; Surveying, recitations, drawing and field practice, 300 hours; Physics, Mechanics, Hydraulics, Strength of Materials, Astronomy, Geology, Chemistry, Mental Philosophy, Logic, Political Economy, History, altogether 680 lectures, recitations, and exercises; Practice in the Chemical Laboratory, 110 hours; Engineering Projects, 240 hours. Besides the above, there are various special exercises requiring time, the amount of which cannot

be assigned. Each recitation requires one hour in the class-room, and to its preparation should be given an average time of three hours.

The studies are given by the year and term in the tabular view of the course, the order there indicated should be closely followed, so that the student may avoid interference of hours of recitation and besides, the studies are there given in that order which best meets the preparation of the student. The following is a detailed view:

NATURAL SCIENCE.

Physics.—See School of Mechanical Engineering. *Chemistry.*—Inorganic Chemistry and Qualitative Analysis. *Geology.*—Elements of Physiographical, Lithological, Historical and Dynamical Geology.

DRAWING.

Projection Drawing.—Use of Instruments in applying the Elements of Descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades, Shadows and Perspective; Drawings finished in colors and by right-line shading; Bridges; Right and Oblique Arches. *Free Hand*—Landscapes; Buildings; Lettering and Ornamental Work. *Topographical*—Sketching; Ink Drawings; Conventional Signs, etc. *Mapping*—Railroad and City and County Maps. *Architectural*—Designing and Drawing of Engineering Structures.

TECHNICAL STUDIES.

Astronomy.—Descriptive Astronomy is given by lectures with a text book. The Equatorial Telescope is in constant use during the favorable weather. Practical Astronomy is given by lectures and practical work with the Astronomical Transit, Sextant and Engineer's Transit adapted to astronomical work; and by astronomical calculations. It includes, the instruments and their adjustment, the determination of time, latitude, longitude and azimuth.

Bridges.—Calculation of the strains in the King Post, Queen Post, Warren's, Howe's and other trusses, by analytical and graphical methods; and the designing of bridge and roof trusses.

Descriptive Geometry.—Problems on the Point, Right-Line

and Plane; Warped Surface; Perspective; Shades and Shadows; Practical Problems.

Geodesy.—Spirit, Barometrical and Trigonometrical Levelling; Base Lines, Stations and Triangulation; Parallels and Meridians; Magnetic Elements; Figure of the Earth; Projection of Maps.

Hydraulics and Mechanics.—See School of Mechanical Engineering.

Land Surveying.—Areas; Distances; Omissions and Corrections; Metrical System; Methods of U. S. Public Land Surveys.

Mathematics.—For pure Mathematics see School of Mechanical Engineering.

R. R. Surveying.—Economic Location; Curves; Turnouts; Crossings; Slope Stakes; Earthwork; Grades; Curvature of Rails; Coning of Wheels.

Strength of Materials.—Elasticity; Safe Limits; Shearing Stress; Flexure and Strength of Beams and Columns; Practical Formulæ.

Stone Work.—Stone, Brick, Lime, Mortar, Cement; Foundations; Retaining Walls; Arches, etc.

Topographical Surveying.—Stadia; Plane Table; Level; Contours; Soundings, etc.

Theory of Engineering Instruments.—Examination of Workmanship and Design; Testing Instrument Maker's Adjustments; Engineer's Adjustments.

PROJECTS.

During the Spring Term of the second year, an accurate Topographical Survey of a Locality is made by the Class, and instruction given in the use of the Level, preparatory to a project in Railroad Engineering, which is executed in the Fall Term of the next year. The Stadia and Plane-table are used as in the U. S. Surveys.

The Project consists of a Preliminary Survey, Locations, Drawings and Estimates.

The Preliminary Survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching.

The Location will consist in running the line over the route decided upon, with all the necessary measurements and calcula-

tions for establishing the grade, setting slope stakes, determining the amount of earthwork, etc.

The Drawings will include Alignment, Profile, Plans, and Sections.

The estimates will give the cost of ground, earthwork structures, superstructure, etc.

A project in Geodesy, or Higher Engineering, will be execucuted during the Senior year.

APPARATUS.

The School is provided with both English and American Instruments for the different branches of Engineering Practice, and for the Astronomical work of Higher Surveying. It has numerous models for illustration of its specialties, and access to the cabinets of the other Schools. To facilitate the practice in Trigonometrical and Land Surveying, it has a specially prepared area, in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them. This area is subdivided by a large number of lines, the positions of which are accurately known, but not by the student. He is then required to determine the position of the "corners" by various methods, and to calculate the enclosed areas. Other problems are given in determining inaccessible distances, passing obstacles, avoiding local attractions, etc., for which the ground is prepared. The number of divisions is so large that no two students need have the same problem, and so accurately laid out that the correctness of the student's work can at once be determined.

An Astronomical Observatory for meridian observations, and of suitable size for the practical exercises in Astronomy, has been erected and is in use. An Equatorial telescope has also been mounted for the use of the students.

The library is well supplied with the latest and best books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Plane Trigonometry; ~~Algebra and Adv. Geometry~~; Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; French.
3. Calculus; Free-Hand Drawing; French.

SECOND YEAR.

1. Advanced Algebra ~~and Analytical Geometry~~; Land Surveying; German.
2. Advanced ~~Calculus~~; Topographical Drawing, and Theory of Instruments; German.
3. Advanced Calculus ~~and Spherical Trigonometry~~; Topographical Surveying; German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry and Laboratory Practice; Railroad Surveying.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Mental Science; Geodesy and Practical Astronomy*.
2. Bridges*; Constitutional History; Geology.
3. Stone Work; Political Economy; Bridge Construction*; ~~Graduating Thesis~~.

MINING ENGINEERING.

Students in Mining Engineering will take the course in Metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores and rocks. In the new Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces and other apparatus required for practical instruction in this department.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The School prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

INSTRUCTION.

The course embraces the knowledge of theory and principles, of constructive detail and of the ordinary routine work of office

practice, so far as these can be successfully taught in a technical school. The technical instruction is given chiefly by lectures, with references to text-book, and is illustrated by sketches, engravings, photographs and models, and practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay, give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work are executed, also models at reduced scale of roof and bridge trusses, ceilings, domes and stairs.

The course in Mathematics, Mechanics, Physics, etc., is nearly identical with that in the other schools of Engineering.

TECHNICAL STUDIES.

Drawing from Casts—Outline sketches and finished drawings in pencil, crayon and charcoal.

Modeling in Clay—From casts and original designs; weekly exercises in designing architectural ornaments.

Elements of Construction.—Lectures and designs for specified problems.

Wood Construction—Frames, roofs, ceilings, domes, heavy frames for mills, &c., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults and domes, centerings, &c.

Iron Construction—Cast and wrought iron, steel, properties and uses, strength, columns, lintels, girders and beams, usual forms and formulæ therefor.

Tinner's Work—Slating, Plastering, Painting and Plumbing.

Architectural Drawing—Ornaments, moulding, finishing in ink, sepia and color, working out full sets of drawings for buildings from sketches, practical perspective and shades and shadows.

Architectural Designing—Original sketches for 3 projects; 2 full sets drawings for buildings for specified private and public purposes.

History of Architecture—Daily lectures on principal styles, characteristics, construction and decoration, making especially prominent those ideas applicable in American architecture, tracings of details, designs for specified problems.

Æsthetics of Architecture—Æsthetics applied to architecture and allied arts, so far as yet made practical; laying out grounds, arrangement of plans, grouping of masses, decoration, internal and external, theories of color and decoration, treatment of floors, walls, ceilings, art objects, furniture, carpets, &c. About 25 original designs required for specified objects.

Estimates—Method of measurement, valuing labor and materials, estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation—Usual methods, by grates, stoves, furnaces, hot water and steam apparatus; the fuels, their properties, heating value and products.

Graphical Statics—Elements, equilibrium polygon and its applications; roofs, loads and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such papers must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, a full course of instruction is arranged, filling three terms, which all architectural students are required to pursue unless they have already had equivalent practice. The system is similar to the Russian system, so much admired at the Centennial and Paris Expositions, but more comprehensive, and applied to Building rather than Mechanical Engineering.

STUDENTS' WORK FROM SCALE DRAWINGS.

First Term—Carpentry and Joinery.

Planing Flat, Square and Octagonal Prisms and Cylinders; Framing with Single, Double and Oblique Tenons; Splices, Straight and Scarfed; Mitre, Lap and Gained Joints; Through and Lap Dovetails; Mouldings, Mitres and Panels.

Second Term—Turning and Cabinet Making, Cylinder, Balusters, Capitals and Bases of Columns, Vases, Rosettes, &c. Fret Sawing, Veneering, plain and ornamental, Inlaying, Carving and polishing.

Third Term—Metal and Stone Work, Pattern Making, Moulding and Casting, Filing and Finishing, Drilling, Screws, Hand and Machine Turning.

Stone Work, executed in Plaster of Paris; Production of Plane, Ruled, Warped and Spherical Surfaces; Voussoirs of Arches, Vaults and Domes; Decorative Carving.

APPARATUS.

A collection of casts donated by the Spanish Government, and another of casts of various architectural details, from Lehr, of Berlin, belong to the Schools of Architecture and Designing; Models of ceilings, roof-trusses and stairs, joints, &c.; also Schroeder's models of joints in stone cutting, &c.

The casts, photographs, etc., of the Art Gallery. A library containing many of the best English, German, French and American Architectural works and Periodicals, such as *Daly's Motifs Historiques*, *Architecture Privee*, *Racinet's Ornament Polychrome*, *Builder*, *Civil Engineer's and Architect's Journal*, *Workshop*, *Skizzenbuch*, *Encyclopedia d' Architecture*, *Owen Jones' Grammar of Ornament*, *Falke's Art in the House*, *American Architect*, *Prang's Illustrations to History of Art*, etc., etc.

A large Carpenter and Cabinet shop, containing full sets of tools, nine sets of shop practice tools, foot lathe with slide rest, chuck, drills, etc. Cross and splitting saws, planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for Master Builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the Preliminary Year unless they shall desire to pursue other studies than those marked in the following: (The figures denote the hours per week). Fee, $10 per term.

1. Wood Construction, ~~10~~; Projection Drawing, ~~10~~; Shop Practice, (Carpentry and Joinery), ~~10~~.
2. Stone, Brick and Metal Construction, ~~10~~; Architectural Drawing, ~~10~~; Shop Practice (Stair Building), ~~10~~.
3. Agreements, Specifications, Estimates, Heating and Ventilation, Architectural Designing, ~~10~~; Shop Practice (Cabinet Making), ~~10~~.

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Projection Drawing, ~~10~~; ~~Plane~~ Trigonometry, ~~Algebra and Advanced Geometry~~; Shop Practice; French.
2. Descriptive Geometry and Lettering, ~~10~~; Analytical Geometry; Shop Practice; French.
3. ~~Modeling~~, 10; Calculus; Shop Practice; French.

SECOND YEAR.

1. Elements of Construction, ~~10~~; Advanced Algebra ~~and Analytical Geometry~~; Free-Hand Drawing, ~~10~~ and Modeling
2. Elements of Construction, ~~10~~; Advanced ~~Calculus~~, Architectural Drawing and Designing. W Col Sketch analyt Geom
3. Graphical Statics, ~~Architectural Drawing~~, ~~Astronomy~~.

[illegible]

THIRD YEAR.

1. Architectural Drawing, ~~10~~; Descriptive Geometry and Drawing, ~~10~~; Chemistry and Laboratory Practice, ~~10~~.
2. History of Architecture, Analytical Mechanics, Physics.
3. History of Architecture, ~~Architectural Designing~~, ~~10~~; Physics.

[illegible]

FOURTH YEAR.

1. Æsthetics of Architecture, 10; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing, 10; Constitutional History; ~~Water-Color Sketching~~, 10, or Geology.
3. Estimates, Agreements and Specifications, Heating and Ventilation, 10; Architectural Designing, 10; Political Economy, ~~Graduating Thesis~~.

COLLEGE OF NATURAL SCIENCE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR BURRILL, Dean.
PROFESSOR WEBER,
PROFESSOR S. H. PEABODY,
PROFESSOR TAFT,
PROF. L. ALLEN GREGORY,
GEORGE A. WILD,

C. I. HAYS.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

SCHOOL OF DOMESTIC SCIENCE.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the Preliminary Year.

Their preparation should be specially good in the Scientific studies of the Preliminary Year. Some knowledge of drawing of natural objects will also greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific names which must be learned in this course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to

the related arts, and to fit him for the field of original research, or for the practical business of the Druggist, Pharmaceutist and Practical Chemist.

INSTRUCTION.

Text-book instruction in the principles of Chemistry and Chemical Physics, occupy six weeks of the first term of the first year. The remainder of the year the recitations alternate with laboratory practice. During the next three years each student is expected to work two hours daily in the laboratory, five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses work at least two consecutive hours daily during such time as their specialty may require.

Text-Books.—Roscoe's Chemistry; Douglas & Prescott's Analysis; Fresenius' Analysis; Miller's Chemistry; Rose's Analysis.

Books of Reference.—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poison.

Four courses of laboratory work have been arranged as follows:

CHEMICAL COURSE.

FIRST YEAR.

First Term.—Qualitative Analysis, Tests and Separation of the Alkalies, Alkaline Earths, (NH_4) 2 S Group, and 1st and 2d Division of H_2S Group.

Second Term.—Qualitative Analysis Completed, Tests, and Separation of 3d Division of H_2S Group, and the Acids, Analysis of 20 Simple Salts, and 20 Compound Substances.

Third Term.—Quantitative Analysis of Sodium Sulphate, Dolomite, Ammonium Alum, Potassium Chloride, Bone Ash, Iron Ore.

SECOND YEAR.

First Term.—Quantitative Analysis of Calamine (Zinc Carbonate), Copper Pyrites Galena, Spathic Iron Ore, Nickel Ore, Clay, Soil, Determination of Iron, Copper, etc., both volumetrically and gravimetrically.

Second Term.—Volumetric Analysis, Alkalimetry and Acidimetry, Preparation of Standard Solutions, Analysis of Sodium Carbonate, Sodium Hydroxide, Potassium Hydroxide, Pearl Ash, Cream of Tartar, Sulphuric, Hydrochloric, Oxalic and Citric Acids, Analysis of Corn or other Grain.

Third Term.—Preparation of Salts, Acids, etc., Electroplating with Silver, Gold, Copper, Nickel.

THIRD YEAR.

First Term.—Ultimate Analysis, Determination of Carbon, Hydrogen, Oxygen, Nitrogen Chlorine, Phosphorus and Sulphur in Organic Compounds, Analysis of Urine.

Second Term.—Blow Pipe Analysis, Determination of a collection of minerals representing over thirty of the Metals. Assaying in both the dry and wet way of Gold, Silver and Lead Ores.

Third Term.—Photography, Preparation of Ether, Absolute Alcohol, Gun Cotton, Cadmium Iodide, Ammonium Iodide, Glacial Acetic Acid, Silver Nitrate, Collodion, Taking Negatives, Printing Positives, Toning and Mounting.

FOURTH YEAR.

First Term.—Gas Analysis, Calibration of Eudiometers, Analysis of Air from Lungs, Atmospheric Air, Marsh Gas, Illuminating Gas and Crude Coal Gas, Analysis of Mineral Waters.

Second Term.—Toxicology, Micro-Chemistry of Poisons, Testing for Mineral and Vegetable Poisons, Separation from Organic Mixtures.

Third Term.—Original Researches, Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Commercial Drugs, White Lead, Red Lead, Paris Green, Sodium Nitrate, Oxalic Acid, Tartar Emetic, Commercial Hydrochloric, Nitric and Sulphuric Acid.

Second Term.—Analysis of Mineral Waters, Preparation of Tinctures, Solid and Fluid Extracts, Reading and Compounding Prescriptions.

Third Term.—Isolation of Alkaloids, Atropine, Strychnine, Quinine, Nicotine, Aconitine, Morphine, Preparation of Salycilic Acid, Examination of Alcoholic Liquors, Reading and Compounding Prescriptions.

THIRD YEAR.

First Term.—Same as second term, second year of Chemical course.

Second Term.—Same as first term, third year of Chemical course, without Analysis of Urine, Reading and Compounding Prescriptions.

Third Term.—Preparation of Salts, Perfumes, Flavoring Extracts, Cosmetics, Electroplating with Gold, Silver, Copper and Nickel.

FOURTH YEAR.

First Term.—Same as second term, fourth year, of Chemical course.

Second Term.—Analysis of Urine, normal and pathological, Reading and Compounding Prescriptions.

Third Term.—Original Researches, Thesis.

AGRICULTURAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Feldspar, Soil, Ashes of Plants and Grains.

Second Term.—Analysis of Commercial Fertilizers, Manures and Minerals used for Fertilizers.

Third Term.—Preparation of Organic and Inorganic Salts, Starch from Potatoes. Corn, Wheat, etc., Sugar, Dextrine, Alcohol.

THIRD YEAR.

First Term.—Same as in Chemical course.

Second Term.—Analysis of Milk, Corn, Wheat, Potatoes, Fruits, etc.

Third Term.—Silt Analysis of Soils, Analysis of Mineral Waters.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course with the Quantitative Analysis of Brass, Solder and Type Metal in third term.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Assaying of Gold, Silver, and Lead Ores, both dry and wet way, Blowpipe Assaying.

Third Term.—Analysis of Malachite, Azurite, Cinnabar, Tin Ore, Cobalt and Nichel Ore containing Arsenic, Bog Manganese, Grey Antimony.

THIRD YEAR.

First Term.—Analysis of Pig Iron, Wrought Iron, Steel, Furnace Slags, Rolling Mill Slags and Cinders.

Second Term.—Same as in Chemical course, with Analysis of Mineral Waters in place of Assaying

Third Term.—Same as second term, fourth year, of Chemical course, with Analysis of Coal in place of Mineral Waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has just been errected, at an expense, including furniture, of $40,000.

The Basement is 12 feet high and contains:

1st. Furnace room for assaying and metallurgical operations.

2d. Mill room for storing and crushing ores.

3d. A large room for the manufacture of chemicals and pharmaceutical preparations.

The first story is 14 feet high and contains:

1st. A large lecture room capable of seating 200 persons.

2d. Qualitative laboratory, which will accommodate 152 students when fully completed. The number of desks now fitted up are one hundred and four. Each desk has an evaporating hood and a wash bowl with constant supply of water. There is a spectroscope table, and a blowpipe table for general use.

3d. Store room stocked with apparatus and chemicals.

The second story is 14 feet high and is designed for the use of advanced students only. It has the following appartments:

1st. A small lecture room with mineralogical cabinet, and set of furnace models for illustrating lectures on metallurgy.

2d. Laboratory for students in agricultural chemistry.

3d. Main laboratory for quantitative analysis. These two laboratories will accommodate 152 students when fitted up to their full capacity. Sixty-four desks are now finished.

4th. Store room with apparatus for all kinds of work in quantitative Analysis. The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Dove's polarizer, with a complete suit of accompanying apparatus; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of areometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen; also a potassium dichromate battery, a galvanometer, a spectroscope and a large binocular microscope; a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

5th. Balance room, containing five chemical balances of the manufacture of Bunge, (Short Beam) Becker & Son, and Troemner. Three additional ones are ordered.

6th. Pharmacy. This room is furnished like a Drug Store with shelves, drawers, prescription desk, balance, graduates, etc. It contains a full set of drugs and pharmaceutical preparations made in the laboratory by students in Pharmacy.

7th. Private Laboratory for instructors.

8th. Gas Analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature. It is furnished with a table specially constructed, and contains a full set of Bunsen's Gasometric Apparatus, a coil, battery, mercury, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry and Laboratory Practice; Trigonometry; ~~Advanced Algebra and~~ Geometry; British Authors or French.
2. Chemistry and Laboratory Practice: Analytical Geometry; American Authors or French.
3. Organic Chemistry and Laboratory Practice: ~~Calculus or~~ Free-Hand Drawing: Rhetoric; French (optional).

or

SECOND YEAR.

1. Laboratory Practice; ~~Physiology~~ or Botany; German.
2. Laboratory Practice; ~~Zoology or Botany~~; German.
3. Laboratory Practice; Zoology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice: Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Work; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; Laboratory Work; Logic.
3. Political Economy; Geology; Laboratory Work ~~and Thesis~~.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's "Lessons in Botany," or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the second year, systematic and structural Botany is continued by illustrated lectures and laboratory work upon fresh, dried and alcholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, are deposited in the library of the Laboratory.

Each student provides himself with suitable pencils, drawing pens and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections. For the first term, a Manual of Botany (Gray's or Wood's) is required. Microscopes and other apparatus are furnished by the University, for which a deposit of three dollars is required, but no charge is made except for damage and material used.

The first six weeks are devoted to the study of the natural orders of flowering plants. About twelve lectures are given upon the characteristics of the prominent orders—their geographical distributions, importance, etc., together with the history of a few specials plants and their products. During this time, two hours per day, three days per week, students analyze in the Laboratory, flowering plants of the more difficult orders, Compositæ, Graminæ, etc., especially such as are best obtained in Autumn. The seventh week is devoted to practical instruction in the use of the compound microscope, and in the preparation of objects. For this, students are furnished with printed directions, and have individual instruction. During the five weeks following, the general morphology of plants, including vegetable anatomy and histology, is studied, there being about ten lectures, and thirty hours of laboratory work. Tests are made from time to time, by the use of disguised vegetable substances. Two weeks are taken for review, finishing drawings and examination. The special morphology of the great divisions of Cryptogamic and Phænogamic plants, their chief characteristics, their classifications, and the identification of species of Cryptogams, or flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kind of fresh water algæ, and the

green-houses supply specimens in nearly all the groups studied. During the term, there are about twenty lectures, and fifty-four hours of laboratory work, besides review and examination.

The most important books of reference in the English language are Sachs' "Text-Book of Botany," LeMaout & Decaisne's "Botany," Gray's "Structural Botany," Lindley's "Introduction to Botany," Berkley's "Cryptogamic Botany and Fungology," Cooke's "Fungi," and "Hand-book of British Fungi."

Vegetable Physiology is studied the third term of the first year. The physiological part of Sachs' Botany, is made the basis of this work, given by lectures with references to other publications, and experimental practice. Respiration, assimilation, the circulation of fluids, the influence of light and temperature, growth and reproduction, are some of the topics treated, and sufficiently show the magnitude and importance of the study. Throughout the course, the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authority for the facts stated.

Anatomy and Physiology.—This study commences the first term of the second year, and the Anatomy is taught by lectures, aided by works of reference. The human skeleton and manikin are made the basis of comparison in the more extended Zoological researches. The Physiology is taught by means of Dalton's Unabridged Work, accompanied by lectures, in which especial attention is given to the subjects of food, digestion, dress, circulation, respiration, ventilation, etc. The senses will be carefully studied, accompanied with suggestions for prolonging their greatest efficiency—the practical and useful always taking the precedence of the merely theoretical, that the controllable powers of the body may be preserved with their most efficient activities, to avoid preventable suffering and death, and secure vigor and happiness.

Zoology continues two terms. In the first, Invertebrate Zoology is studied, unfolding the cardinal facts exemplified in the Sub-Kingdoms, Protozoa, Cœlenterata, Anuloida, Anulosa and Mollusca, together with the general principles of respiration, circulation, special methods of reproduction and development; geographical and geological distribution; principles of natural classification, depending upon morphological type and specialization of the functions, etc.

Vertebrate Zoology follows, embracing embryology, modification of plan by which animals are adapted to the various con-

ditions of existence, as manifest in their Comparative Anatomy; Systematic Zoology, so that the orders may be recognized at sight. etc. Nicholson's Manual of Zoology is used as a text-book.

Osteology and Taxidermy are taught in extra classes.

Osteology is taken up the winter term, to give the student a practical and theoretical knowledge of the vertebrate skeleton.

It consists in laboratory work, alternating daily with a study of the comparative Ostéological collections in connection with recitations from "Flower's Osteology" as text.

In the laboratory, special attention is given to the cleaning and mounting of both Ligamentary and Articulated skeletons.

Taxidermy is commenced the spring term, and is designed to fit the student for the practical operations of collecting, preserving, and mounting objects of Natural History.

During the early part of the term special attention is given to the collection and "making" of skins of Birds and Mammals, and numerous specimens are so collected and prepared by each student; while the latter part of the term is occupied in mounting specimens from both fresh and dried skins.

Geology.—In Geology, Dana's Manual is used; commencing with Dynamical Geology, which explains the forces known to produce observed phenomena in the crust of the earth; as Life, in the formation of lime-stone, coal, peat; water, in eroding, transporting and depositing material for strata; heat, as manifested in consolidation, metamorphism and crystallization, as well as mountain folds on the surface of a shrinking globe.

Lithological Geology is the next term's work. This treats of the kinds, nature and material of rocks, stratified and unstratified; their mineral constituents; structure original or induced; concretions, veins, dykes, etc.; methods of determining the chronological order of the strata. Also the historic development of the earth as revealed by

Paleontology, or the entombed fossils of the Silurian and Devonian ages. The third term explains the Carboniferous age with its coal, the Reptilian and Mammalian ages, with their wonderful inhabitants; the Glacial period with its continent of ice, and through to the present time. Here also are discussed the elements of Time, the system of Life, the origin of Species, the climax in Man.

Physical Geography and Meteorology.—The principles of the phenomena manifest in the life of the earth bear the same relation to Geology that Physiology does to Anatomy. This subject, a

result of the facts of Geology, with an application of the laws of Physics, is taught by lectures and works of reference. It explains how the solid earth, influenced by winds and waters, driven by heat and electricity, aided by light, constitutes a fit abode for man, the last link of terrestrial being.

Entomology.—After three or four introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classification,—four lectures, and one review or two hours of practical work per week. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term three lectures per week are given upon injurious and beneficial insects, methods of exterminating, etc., and four hours per week are taken for laboratory work, naming species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study.

Students are required to provide themselves with collecting nets and bottles, pins, and lined boxes, and books for notes. Microscopes and other required apparatus are furuished by the University.

Microscopy and Fungology.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aparture, drawing and photographing objects, preparation and mounting of material, etc. The application, as indicated above, is mainly, but not exclusively, devoted to minute fungi, including those of the different fermentations and putrefactions. Such fungi as are known or supposed to be injurious to plants or animals are studied as carefully and thoroughly as circumstances permit, cultures being made for the purpose, and specimens obtained from various sources.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses ; a collection of Rocky

Mountain and Western Plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C., and others obtained by exchange from various parts of the United States. A collection of the fungi of the vicinity contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits by Dr. Auzoux, exhibiting structure and development, are in the cabinet.

In Entomology numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have further increased this number, amounting now to about three thousand species.

The University now has first-class microscopes of four different styles from European makers, one by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands, a new pattern, manufactured in the shops of the University.

In *Zoology*, the cabinets contain a human skeleton, and a manikin made by Dr. Auzoux; skeletons of the different orders of mammals, and of birds; stuffed preparations of a large number of birds, mammals, fishes, reptiles, etc.; a dissected eye, trachea and vocal apparatus, in *papier-mache*, by Dr. Auzoux; collections of shells, fossils and insects.

The Geological Cabinet has been immensely improved the past year. In addition to the specimens from the State Geological Survey and other illustrative specimens, mineral and fossil, the cabinet has been the recipient of Prof. Ward's celebrated college series of famous fossils, so essential in elucidating the various phases of life in Geological History. This set was the munificent donation of Emory Cobb, Esq., President of the Board of Trustees.

A valuable and extensive collection of the leads of the State, and accompanying mineral, was donated by Gen. J. C. Smith, and other gentlemen, of Galena.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing, (optional); Trigonometry; ~~Advanced Algebra and Geometry~~; French.
2. Chemistry; Free-Hand Drawing (optional); Analytical Geometry; French.

3. Vegetable Physiology; Chemistry, or Free-Hand Drawing; Rhetoric; French, (extra).

SECOND YEAR.

1. Advanced Anatomy and Physiology; Botany; German.
2. Zoology; Botany; German.
3. Zoology; Economic Entomology; German.

THIRD YEAR.

1. Geology; Mineralogy; German; Ancient History (optional, extra).
2. Geology; Physics; German; Mediæval History (optional, extra).
3. Geology; Physics; Modern History, ~~or Astronomy~~.

FOURTH YEAR.

1. Meteorology and Physical Geography; History of Civilization; Mental Science.
2. Microscopy and Fungology; Constitutional History; Logic.
3. Political Economy; ~~Physical Laboratory~~; Natural History Laboratory Work; ~~Graduating Thesis~~.

SCHOOL OF DOMESTIC SCIENCE.

This is the first School of Domestic Science of high grade, and with a complete course, organized in the United States, if not the first in the world.

OBJECT OF THE SCHOOL.

It is the aim of the School to give to earnest and capable young women a liberal and practical education, which shall fit them for their great duties and trusts, making them the equals of their educated husbands and associates, and enabling them to bring the aids of science and culture to the all-important labors and vocations of womanhood.

This School proceeds upon the assumption that the housekeeper needs education as much as the Architect, the nurse as well as the physician, the leaders of society as surely as the leaders of Senates, the mother as much as the father, the woman as well as the man. We discard the old and absurd notion that education is a necessity to man, but only an ornament to woman. If ignorance is a weakness and a disaster in the places of business where the income is won, it is equally so in the places of living, where the income is expended. If science can aid agriculture and the mechanic arts to use more successfully nature's forces and to

increase the amount and value of their products, it can equally aid the house-keeper in the finer and more complicated use of those forces and agencies, in the home where winter is to be changed into genial summer by artificial fires, and darkness into day by costly illumination; where the raw products of the field are to be transformed into sweet and wholesome food by a chemistry finer than that of soils, and the products of a hundred manufactories are to be put to their final uses for the health and happiness of life.

The purpose is to provide a full course of instruction in the arts of the household, and the sciences relating thereto. No industry is more important to human happiness and well-being than that which makes the home. And this industry involves principles of science, as many and as profound as those which control any other human employment.

TECHNICAL STUDIES.

Food and Dietetics.—This study extends through two terms. The first term is devoted to the consideration of the simple aliments, such as Sugar, Starch, the Albuminoids, Fats, etc. In the second term, the studies include the compound aliments; Chemical structure of the cereals, especially the Wheat; the chemistry of Bread-Making, care of Milk and Butter; the nature, uses, preservation and preparation of animal and vegetable food, for the healthful, and for the invalid; the chemistry of cooking; chemical composition, preparation and physiological effects of the beverages, such as Tea, Coffee, Chocolate, etc., and the effects of alcholic drinks.

Domestic Hygiene.—Location of Dwelling Houses, importance of Drainage, uncleanliness as a source of disease; necessity of ventilation and sunlight; uses, construction, material and hygiene of dress; principles of nursing and care of the sick.

Household Esthetics.—Principles of taste as applied to ornamentation, furniture, wall and ceiling decoration, carpets, pottery, clothing and landscapes, harmony of colors, forms, proportions, etc.

Household Science.—Principles of heating and ventilation, chemistry of illumination, materials of culinary utensils, tin, iron, brass, etc.; adulterations of foods.

Domestic Economy.—Economy of time, management of ser-

vants, government and instruction of children, household expenditures. *Usages of Society.* Laws of etiquette, social customs, etc.

Home Architecture.—Principal architectural styles, as Grecian, Roman, Gothic, Renaissance, Modern Gothic, etc.; exterior of the house; general characteristics; interiors, chief requisities, convenience, light, warmth, etc.; requirements of different apartments, programmes for designs, as of cottages of various styles and capacity, farm houses, villas, etc.; internal decoration and construction; sanitary requisites, cellars, walls, water supply, etc.

Landscape Drawing and Green-House Work see School of Horticulture.

For other studies see the proper Schools.

HEALTH AND PHYSICAL TRAINING.

A spacious Gymnasium for young women has been fitted up in the library wing, and instruction in calisthenics is given to two or more classes daily. Lectures on health, and its conditions, and on other important topics, will be delivered to these classes, at suitable intervals, and great pains will be taken to secure, to the utmost possible extent, physical vigor, robust health, and a graceful carriage, and to prepare young women to take enlightened care of their own health, and the health of others under their charge.

The materials for the calisthenic uniform must be made up under the direction of the Instructor in this department.

The Trustees desire that all female students shall participate in these exercises unless excused for good cause. They have been witnessed and heartily approved by some of the most eminent medical men in the State, and their value as a means of maintaining good health during a prolonged period of study, and as helping to develope a more perfect physical form and to give ease, strength and grace, is beyond debate.

COURSE OF DOMESTIC SCIENCE.

Required for Degree of B. S. in School of Domestic Science.

FIRST YEAR.

1. Chemistry; Trigonometry; Drawing, (full term); British Authors.
2. Chemistry; Designing and Drawing; American Authors.
3. Chemistry; Designing and Drawing; Rhetoric.

SECOND YEAR.

1. Botany; Physiology; German or English Classics.
2. Food and Dietetics, (simple aliments) Botany and Green-House; German or English Classics.
3. Food and Dietetics, (Compound Aliments and principles of cooking, etc.;) Zoology; German or English Classics.

THIRD YEAR.

1. Domestic Hygiene; Ancient History; German or French.
2. Physics; Mediæval History; German or French.
3. Physics or Landscape Gardening; Modern History; German or French.

FOURTH YEAR.

1. Household Esthetics; Mental Science; History of Civilization.
2. Household Science; Constitutional History; Logic.
3. Domestic Economy, Usages of Society, etc.; Political Economy; Home Architecture; Graduating Thesis or Oration or Essay.

COLLEGE OF LITERATURE and SCIENCE.

SPECIAL FACULTY.

THE REGENT,

PROFESSOR SNYDER, Dean.
PROFESSOR PICKARD,
PROFESSOR SHATTUCK,
PROFESSOR WEBER,
PROFESSOR CRAWFORD,
PROFESSOR BURRILL,
PROFESSOR TAFT,
CHAS. E. PICKARD.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology and Botany or Book-Keeping, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School have been allowed to make up the required Latin after entering, with the aid of private tutors.

Candidates for the School of Ancient Languages will be examined also in the Greek, but not in the elements of Botany, Physiology and Natural Philosophy. The examinations in Latin and Greek will be as follows :

LATIN.

Latin Grammar including Prosody. (Harkness' or Allen and Greennough's), Latin prose composition. (Forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 166, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen

and Greenough's Latin Composition), four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted. The so-called Roman method of pronunciation of Latin is recommended, as found in Allen and Greenough's, or in the last edition of Harkness's Grammar.

GREEK.

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sound of the vowels and diphthongs and pronunciation according to the accent are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors or publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, writers, and professors, in their special departments, require a knowledge of the Ancient, as well as the Modern Languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the Arts. The large liberty allowed in the selection of the special studies of his course will permit the student to give such direction to his education as will fit him fully for any chosen sphere or pursuit.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary textbook study, lectures and practical exercises in all the departments.

including original researches, essays, criticism, proof-reading, and other work intended to illustrate the studies pursued, and exercise the student's own powers. It is designed to give to all the students voice culture and a training in elocutionary practice.

A prominent aim will be to teach the right use of books, and thus prepare the student for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of Literature and Science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of practice in, English Composition, should be mentioned THE ILLINI, a monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided for in the Mechanical Building, and a press with the requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over eleven thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room, a list of which is given on page 22.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English Language, affording a training equivalent to the ordinary studies of the classical language. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American Literature from

the middle of the sixteenth century to the present time. All the really representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read the entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year some four or five of the great masters are studied, their work analyzed, the shaping forces of their times, and their influences upon succeeding times are investigated. Lectures are given from time to time on Poetry, Epic, Lyric, Dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German; to Philology; to the Philosophy of English Literature, and to Æsthetics. Essays, Forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease, scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the Etymologies common to these languages and the English, and thereby a large advantage is gained by the student in linguistic culture. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year, the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, and a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition and conversation.

Mathematics, Physics and Astronomy.—For these studies, see School of Mechanical Engineering.

Natural Sciences.—See Schools of Chemistry and Natural History.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization and progress of the race. They

embrace also the history of the Arts and Sciences, and of Civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law. The instruction is given chiefly by lectures, with readings of specified authors, and the study of historical geography and chronology.

The course occupies six terms in the third and fourth years of the University Courses.

THIRD YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; General European History; European Geography.

FOURTH YEAR.

Constitutional History of England and the United States, five lectures a week; History of Civilization, Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department are taught chiefly by lectures, with readings of specified authors, and written essays. These studies require much maturity of powers, and are therefore confined to the fourth year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental Physiology, or connection of Body and Mind, healthful conditions of thought, growth and decay of mental and moral powers. Philosophy of Education. Theory of Conscience; Nature of Moral obligation, Moral feeling. The Right. The Good. Practical Ethics; Duties. Formation of character. Ancient Schools of Philosophy; Modern Schools of Philosophy. Influence of Philosophy on the progress of civilization, and on Modern Sciences and Arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of argument, in the detection and answer of fallacies, and in the formation of habits of thinking, and the common judgments of life.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for Degree of B. L.

FIRST YEAR.

1. Cicero de Amicitia, or British Authors; French; Trigonometry ~~and Advanced Algebra and Geometry~~.
2. Livy, or American Authors; French; Analytical Geometry.
3. Rhetoric; French; Calculus, or Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology, or Botany.
2. English Classics; German; Zoology, or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History ~~or Geology~~.
2. German; Physics or Chemistry; Mediæval History.
3. German; Physics; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. English Literature; Constitutional History; Logic.
3. Æsthetics; Political Economy; ~~Chemistry or~~ Geology; ~~Graduating Thesis or Oration~~.

SCHOOL of ANCIENT LANGUAGES and LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences and substitution of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works

read, and a free use of the library is urged. It is intended that each student completing the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning of the course, illustrating the works read. In the first term of the third year Ancient History is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

For the studies in *History, Philosophy, etc.*, see School of English and Modern Languages.

For the studies in *Mathematics and Natural Science*, see Schools of Mechanical Engineering and Natural History.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry ~~and Advanced Algebra~~ and Geometry.
2. Livy and prose composition. Boise and Freeman's selections from Greek Authors and prose composition; Analytical Geometry.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Calculus.

SECOND YEAR.

1. Satires of Horace; Thucydides or German; Physiology.
2. Terence; Sophocles or German; Zoology.
3. Tacitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History or Geology.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. History of Civilization; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; English Literature; Logic.
3. Æsthetics; ~~Plato~~; Political Economy; Graduating ~~Thesis or Oration~~.

ADDITIONAL SCHOOLS.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR WM. A. WOOD,

LIEUT. INFANTRY U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the College classes of the first and second year are enrolled in the companies of the University Battalion, and receive instruction according to the following programme, the exercises occupying from one to three hours each week (see figures in programme.)

The Military Organization of the University ranks in the State Militia as the University Battalion, Illinois National Guards.

PROGRAMME.

FIRST YEAR.—School of Soldier, Manual of Arms, 3. School of Company, Firings, etc., 2. School of Battalion, 2.

Reviews of Company and Battalion Drill, 3. Bugle Calls and Skirmish Drill, 1. Skirmish Drill, and Battalion Evolutions, 2.

SECOND YEAR.—Reviews, Picket Duty, 1. Guard and Picket Duties, 1. Skirmish and Battalion Evolution, 1 to 2.

Reviews, 1. Bayonet Fencing, 1. Battalion Evolutions, Target Practice, 1 to 2.

CLASS IN MILITARY SCIENCE.

A class is taught in Military Science and Art, as far as is requisite for officers of the line. From this class are selected the officers of the several companies, for which they act as drill sergeants and instructors. The military instruction is now under the charge of Lieut. Wm. A. Wood, an experienced officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 fixed cartridges and 1,000 blank cartridges annually for target practice, with 200 rounds for artillery.

No student is eligible to the military class till he has reached

the second or Sophomore year, and is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other courses of study, to allow the members of other courses to enter this. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as Captains in the State Militia, such graduates of the University as have completed the studies of the Military Classes, and have obtained the requisite experience in Command in the University Battalion. In order to obtain the commission the Student must be approved by the Faculty and pass satisfactorily an examination in Military Science and Tactics before a Committee appointed by the Faculty of the University. It is expected that in order to get the required experience in Command, the members of the Military Class of the third or Junior year will serve as commissioned officers of the several companies of the Battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after their first term, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of dark blue cloth Students can procure them ready-made on their arrival here The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms under careful leaders. Fee 50 cents.

Telegraphy.—In connection with the military department there is a Telegraph office in the new University Building with accommodations for learners, and connections with the Mechanical and Military building, the Dormitory and several private houses, making about three miles of telegraph lines. The stud-

ents form an association or class, and the members join the University main line, using their own instruments in their rooms. The class appoints its own officers, inspectors, etc., and pays a small contribution for maintaining batteries, etc. At present there are twenty-seven instruments on the line.

COURSE IN SCHOOL OF MILITARY SCIENCE

SECOND YEAR.

1. School of the Soldier and Company; Bayonet Fencing, 2.
2. School of Battalion; Ceremonies and Reviews; Skirmish Drill.
3. ~~Brigade and Division Evolutions~~; Sword Fencing, 2.

THIRD YEAR.

1. Guard Outpost and Picket Duty; Sword Fencing, 2.
2. Military Administration; Reports and Returns; Theory of Fire-arms; Target Practice, 2; Artillery Drill.
3. Organization, etc., of armies; Art or War; Field Fortifications, 2.

SCHOOL OF ART AND DESIGN.

UNDER CHARGE OF PROFESSOR PETER ROOS,

(Late of the Art Academy, Boston.)

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen course may require. 2. It offers to such as have a talent or taste for art, the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of Design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of Drawing and Designing. It is the purpose to keep this school of Design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

Students not seeking a professional training may yet avail themselves of the two years course in Industrial Art. Any person

of ordinary ability who faithfully completes this course will be qualified to teach drawing and designing in Public Schools, or enter professions with great advantage in the various branches of industry, where artistic skill and taste are indispensible to success.

FIRST TERM.

(Exercises in Outline.)

Elements of Form; Analysis of Compound Forms; Elementary Designs; Elementary Perspective by aid of objects; Elements of Historic Ornaments; Memory Exercises.

SECOND TERM.

Enlargement and Shading from copy; Ornamental Designs from plant form; Naturalistic and Conventional Arrangement; Harmonious lines and Distribution of Form; Perspective drawing of Objects, Plants, etc.; Features of the Human head; History o Early Art.

THIRD TERM.

Outline Drawing and Shading from Casts of Ornament; Application of decorative forms to flat and round surfaces under various conditions; Designs for specified objects; Advanced Perspective and Shadows; Harmony and contrast of color. (Lectures on Art, and its History).

FOURTH TERM.

(Clay and Wax Modelling.)

Basso Relievo Ornament from the Solid. Features and the Human head from description; Relievo Ornament from shaded copies or drawings; Original Designs for decorative purposes; Enlargements and Reduction from cast; History of Styles of Ornament.

FIFTH TERM.

Shading from Statuary, Casts, etc.; Drawing of Landscape and Animals from copy in Charcoal and Sepia; Color applied to Decorative Art; Designs for useful Objects: Perspective drawings of interiors of rooms: Physics on Lettering.

SIXTH TERM.

General review of the principal work done; Specimen plates to be completed; Optical and Physical principles of Color in Nature; Aerial Perspective; Sketching from Nature in Charcoal and Color; Artistic Anatomy of Form and Proportion, by illustrated lectures; Famous Artists and their principal works.

Students having passed the above course with thoroughness will be permitted to enter the advanced classes.

The following course is for those who wish to become accomplished either as Designers, Painters or Teachers. In order that the student may acquire thoroughness in the branch he wishes to pursue as a specialty, the subject has at this stage been formed into two divisions, viz: Decorative and Pictorial. The teacher

student must give attention to both branches. and with him theory will necessarily supersede practice. Opportunities will be afforded such pupils at times to teach in the elementary classes whereby greater efficiency will be acquired.

SPECIAL COURSE IN PAINTING.

Trees, Animals and Figures from copy and from nature in Pencil, Charcoal and Sepia; Aerial Perspective.

Anatomy of Expression; External muscular developement; Shading from Statuary in Charcoal and Monochrome; Composition drawing from description; Memory Exercises.

Water Color Painting from pictures; Sketching from Nature in Sepia and Water Color; Copying from Oil Paintings of Portraits and Landscapes.

Sketching from Nature in Oil Colors; Rapid studies of interiors with varied arrangement of light and shade; Pictorial compositions introducing figures or animals; Theory and History of Art.

Portrait Painting from life; Pictures finished from sketches; Studying of Groups of Still Life Subjects; Painting of ideal compositions of one or more heads; Chemistry of color.

ADVANCED COURSE IN DESIGNING.

Studies in Clay or Wax.

Ornaments and Plant form in Basso releivo from flat examples; Designs adaptive to useful objects; The Human Figure from cast or original compositions, reproduced by casting in metal or plaster; Processes of manufacture: Monumental designs.

Shading from cast and from nature; Classic objects and furniture enlarged from copy; Designs finished with Pen, Brush and Distempera color; Architectural construction.

Design for Church Decoration in Historic Styles; Memorial Windows for stained glass; Decorative designs; Commemorating events in History; History of manufactures, and important inventions.

ADVANCED TEACHERS' COURSE.

A teacher must be prepared for emergencies of which the professional Designer or Artist have no experience. A general knowledge of the several subjects is therefore recommended. The decorative, and painting course will be worked together so as to form a thorough course for teachers. By the guidance of natural inclinations a subject should be chosen to which more time be devoted so as to make it a specialty. Some have a su-

perior ability for drawing faces, and portraits, others can more easily originate patterns and designs.

The authorities of the University have provided, that, persons not connected with the Institution may join the Drawing and Painting Classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies. and is therefore not provided by the Trustees. But as many students, especially young lady students, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

MISS JENNIE C. MAHAN,

Teacher of Instrumental Music, has marked out the following

Course of Instruction:

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvernay's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudes de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies. Op. 740, Books 1, 2, 3; Cramer's Studies, Books 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction for term of ten weeks—2 lessons a week.....	$10.00
For term of ten weeks—one lesson a week.............	6.00
Practice on piano, one hour daily per term.............	2.00

MRS. JENNIE HOLLISTER,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week.......................	$12.00
Ten weeks—one lesson a week........................	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged students of the University.

PREPARATORY CLASSES.

[TO BE CONTINUED TILL JUNE, 1881.]

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the Preparatory Studies, lying between the Common School studies and the proper College studies.

The High Schools of the State are already doing such excellent work, and are multiplying to an extent that it is decided that this Preliminary work shall be dismissed from the University entirely after next year, ending June, 1881.

Candidates for these classes should not be less than fifteen years old. They must also pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a Second Grade certificate for teachers. This examination may be made by county superintendents. The studies taught in the preliminary year are as follows:

PREPARATORY STUDIES.

For the Colleges of Engineering, Agriculture and Natural Science.

First Term.—Algebra—(Olney's) Fundamental rules, Factoring, Common Divisors and Multiples, Powers and Roots, Calculus of Radicals, Simple Equations, Proportion and Progression. *Physiology*—(Dalton's or an equivalent.) *Book-Keeping*—Single and Double Entry.

Second Term.—Algebra—Quadratic equations. *Geometry*—Plane Geometry, Lines, Circumferences, Angles, Polygons as far as equality in Olney's Geometry. *English*—Elements of Composition. (Gilmore's Art of expression or equivalent.) Orthoepy and Word Analysis. (Introduction to Webster's Academic Dictionary). *Natural Philosophy*—(Norton's or an equivalent.)

Third Term.— Geometry completed, including solid Geometry and the Sphere. *English* as in second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin*, Cæsar. *Greek*, Grammar and Reader.

11

Second Term.—Algebra and Geometry, as above given. *Latin*. Cicero's Orations. *Greek*, Xenophon's Anabasis.

Third Term.— Geometry Completed. *Latin*, Virgil's Æneid. *Greek*, the Anabasis.

N. B. Greek is required only for the School of Ancient Languages. The School of English and Modern Languages. requires Physiology, Natural Philosophy, Botany, or Book-keeping instead of Greek.

Students in the preparatory studies are not matriculated as University students. They pay no entrance fee, but are charged a tuition fee of Ten Dollars a term. and the incidental fee of Seven and a half Dollars a term. They have all the privileges of the library and of the public lectures.

N. B. No student is matriculated as a College student till all preparatory studies are completed.

EXAMINING SCHOOLS.

The Trustees have authorized the Faculty to designate one or more High Schools in each County of the State, of sufficiently high grade and good reputation, whose certificates of examination, in the branches required of candidates for the University, may be received in lieu of the usual examination of the University.

These must be Graded, or High Schools of good reputation, and of sufficiently extended course to prepare students for the University. The principal teachers of the schools selected will be authorized to prepare questions and conduct examinations of any of their students desirous of entering the University. but the papers must be sent to the University for final decision.

EXAMINING SCHOOLS.

Rockford West High School	J. H. Blodget,	Principal.
Buda High School	J. V. Wilkinson,	"
Maplewood High School	S. F. Hall,	"
Sterling, 2d Ward High School	Alfred Bayliss,	"
S. Belvidere High School	J. W. Gibson.	"
Geneseo High School	B. F. Parge,	"
Belvidere High School	H. J. Sherrill,	"
Lanark High School	F. T. Oldt,	"
Gibson City High School	W. A. Wetzel,	"
Belleville High School	Henry Roab,	"
*Rochelle High School	P. R. Walker,	"
*Peru High School	Joseph Carter,	"
*Shelbyville High School	C. L. Howard,	Supt.
*Sycamore High School	H. A. Blanchard,	"

*DeKalb High School	S. L. Graham, Principal.
*Dwight High School	Jesse Hubbard, "
*Macomb High School.	J. F. Gowdy, "
Kinmundy High School	N. S. Scovell, "

*These Schools are candidates for the rank of Accredited Schools, but can not be examined in time for this catalogue.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making the application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered on the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	————, Principal.
Lake View High School	A. T. Nightingale, "
Champaign, West High School	T. L. Evans, "
Decatur High School	E. A. Gastman, "
Salem High School	Loyd Crossett, "
Champaign, East Side School	I. L. Betzer, "
Urbana High School	J. W. Hayes, "
Elmwood High School	J. M. Crow, "
Oak Park High School	B. L. Dodge. "
Chicago Central High School	Geo. Howland, "
Chicago S. Division High School	Jeremiah Slocum, "
Chicago N. Division High School	H. H. Belfield, "
Chicago W. Division High School	Ira S. Baker, "
Hyde Park High School	Leslie Lewis, Supt.
Marengo High School	C. J. Allen, "
Blackstone High School	Wm. Jenkins, "
Kankakee High School	C. W. Rolfe, "
Mattoon E. Side High School	E. P. Rose, "
Springfield High School	F. R. Feitshans, "
Monticello High School	Gilbert A. Burgess, "
Warren High School	D. E. Garver, "

MISCELLANY.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies, without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

DEGREES AND CERTIFICATES.

The law provides that "on recommendation of the Faculty, the Trustees may authorize the Regent, as President of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similiar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statement of work done and of credits attained.

4. It is designed that the requirements for all the Bachelors' Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The Degree of Bachelor of Letters, B. L., will be given

to those who complete the course in the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course of the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be only given to those who have pursued and passed examinations on a year of prescribed post-graduate studies, and presented an accepted Thesis, or after a term of successful practice with a Thesis.

BOARD.

There are many boarding houses near the University where either table board or board and rooms can be obtained, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2.00 per week. Some students prepare their own meals, and thus reduce expenses still farther.

Coal is purchased at wholesale and furnished to the students at cost.

For estimates of annual expenses, see page 87.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible, to all who desire. It is classified into Educational and Remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative Labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden and shop labor is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour.* Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill, secure more pay.

Some students, who have the requisite *skill, industry and economy*, pay their entire expenses by their labor; but, in general, young men can not count upon doing this at first, without a capital to begin with, either of skill, or of money to serve them till a degree of skill is acquired. As the number of students increases

it is found more and more difficult to furnish the labor needed, and students can not count so certainly upon finding employment.

STUDENTS' GOVERNMENT.

For several years an experiment has been in progress, in self-government of the Students of the University. By permission of the Faculty, the General Assembly of the Students was organized, and a constitution adopted providing for the election of a President, Vice-President, Secretary and Marshal; for a Senate of twenty-one members, a court consisting of a Chief Justice and two Associate Judges. Under this constitution, laws are enacted by the Senate, which become valid only when approved by the Regent and Faculty of the University. All offenses against these laws are tried before the Student's Court, and punished by fines according to the class of the offense. Students refusing to pay the fines imposed by the Student's Government are referred to the Faculty and if sentence is approved, are sentenced to such penalties as the Faculty may deem proper. The government has thus far rendered important aid in maintaining good order in the dormitories and grounds, in preserving public property, in preventing the visiting of saloons, and in other matters requiring the intervention of authority, and above all in cultivating kindly relations between the Students and Faculty and a spirit of manliness and self control.

GENERAL DIRECTIONS TO STUDENTS..

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed:

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of the common branches. None of the common branches, such Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 26 and 81.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College. (See page 81.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten, the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the Student to membership in the University until he completes his studies, and must be paid before he enters. Amount...... $10.00

THE TERM FEE for Incidental Expenses is, for each student 7.50

Room Rent in University Dormitory, each Student per Term.................................. $2.00 to $ 8.00

Each Student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $8, to pay for Chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are the estimated Maximum and Minimum Annual Expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University:

	MIN.	MAX.
Term Fees and Room Rent for each Student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing, at 75 cents per dozen	13.50	27.00
Total Annual Amount	$123.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$10.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting and Drawing to Special Students	10.00
Graduating Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home wiih large amounts of spending money*, without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money beyond that required for fees, board bills and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under 20 years of age.

CALENDAR FOR 1880.

Examinations for Admission	Monday, September 13
First or Fall Term begins	Tuesday, September 14
Closing of the First Term	Tuesday, December 21

WINTER VACATION.

FOR 1881.

Examination for Admission to Advanced Classes	Monday, January 3
Opening of the Second or Winter Term,	Tuesday, January 4
Anniversary Day	March 11
Second Term Closes	Tuesday, March 21
Third or Spring Term begins	Tuesday, March 21
Baccalaureate Address in University Chapel	June 4
Class Day	June 5
Society Addresses	June 6
Commencement	Wednesday, June 7

SUMMER VACATION.

Examinations for Admission,	Monday, September 11
First or Fall Term begins	Tuesday, September 12

LEARNING AND LABOR.

CATALOGUE AND CIRCULAR

OF THE

Illinois Industrial University,

URBANA, CHAMPAIGN COUNTY, ILL.

1880-81

CHICAGO:
Cushing, Thomas & Company, Printers.
1881.

BOARD OF TRUSTEES.

*DECEASED.

FACULTY.

SELIM H. PEABODY, Ph. D.,
Regent, and Professor of Mechanical Engineering and Physics.

THOMAS J. BURRILL, M. A.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

DON CARLOS TAFT, M. A.,
Professor of Geology and Zoölogy.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of Ancient Languages, and Secretary.

HENRY A. WEBER, Ph. D.,
Professor of Chemistry.

GEORGE E. MORROW, LL. B.,
Professor of Agriculture.

OFFICERS AND INSTRUCTORS.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

PETER ROOS,
Professor of Industrial Art and Designing.

WILLIAM T. WOOD,
SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

MELVILLE A. SCOVELL, M. S.,
Professor of Agricultural Chemistry.

*CHARLES I. HAYS, B. S.,
Assistant in Horticulture and Botany.

CHARLES E. PICKARD, B. A.,
Assistant in English and Ancient Languages.

‡EDWIN L. LAWRENCE,
Head Farmer.

EDWIN A. KIMBALL,
Foreman of Machine Shop.

HENRY M. BEARDSLEY, B. L.,
First Assistant in Chemical Laboratory.

JEROME SONDERICKER, B. S.,
Instructor in Right Line Drawing.

J. C. FEITSHANS, M. A.,
Instructor in Elocution.

---

*RESIGNED, APRIL 1, 1881 ‡RESIGNED DEC. 1, 1880.

MRS. JENNIE HOLLISTER,
Teacher of Voice Culture and Singing.

†MISS JENNIE C. MAHAN,
Teacher of Instrumental Music.

MRS. C. E. MALTBY,
Teacher of Instrumental Music.

CHARLES C. BARNES,
Second Assistant in Chemical Laboratory.

NELSON S. SPENCER,
Foreman of Carpenter Shop.

THOMAS F. HUNT,
Foreman of Farm.

†Resigned, Jan. 1, 1881.

LIST OF STUDENTS.

SENIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Allison, James G	Literature and Science	McKinney, Tex.
Armstrong, James E	Natural History	Seneca.
Barnes, Charles C	Chemistry	Champaign.
Beach, Bayard E	Literature and Science	Champaign.
Bellamy, Albert	Literature and Science	Girard.
Birney, Frank L	Chemistry	Urbana.
Boothby, Arthur	Mechanical Engineering	Pittsfield.
Boyd, Comma N	Agriculture and Military	Sheffield.
*Butler, Cyrus W	Civil Engineering	Anna.
Coddington, Arch. O	Literature and Science	Champaign.
Cooper, Frederic E	Chemistry	Girard.
Davis, Arthur E	Literature and Science	Salem.
Dennis, Charles H	Lit. and Science and Military	Decatur.
Dressor, John C	Agriculture and Military	Cottonwood Grove.
Forsyth, James	Natural History	Springfield.
Hammett, Frank W	Civ. Engineering and Military	Camargo.
Hill, Fred. L	Civil Engineering	Paxton.
Hill, T. Crawford	Lit. and Science and Military	Tolono.
Kingman, Arthur H	Chemistry	Wakefield, Mass.
McKay, Francis M	Literature and Science	Ottawa.
Mansfield, Willis A	Literature and Science	Marengo.
Mason, William K	Agriculture	Buda.
Morse, John H	Lit. and Science and Military	Cazenovia.
Nicolet, Charles H	Civil Engineering	Champaign
Pearman, J. Ora	Chemistry	Champaign.
Philbrick, Ethan	Civ. Engineering and Military	Baileyville.
Pepoon, Herman S	Natural History	Warren.
Pepoon, William A	Agriculture	Warren.
Pletcher, Francis M	Natural History	Plattville.
Porter, Frank H	Lit. and Science and Military	Garden Prairie.
Ross, Sprague D	Chemistry	Cottonwood Grove.
Schwartz, Joseph	Chemistry	Salem.
Seymour, Arthur B	Natural History	Camp Point.
Slade, Byron A	Chemistry and Military	Sycamore.
Stacy, Morelle M	Literature and Science	Princeton.
Sturman, James B	Literature and Science	Dahlgren.
Talbot, Arthur N	Civ. Engineering and Military	Cortland.
Weston, William S	Literature and Science	Champaign.
*Wilson, Maxwell B	Agriculture	Paris.

*Deficient in one or more studies.

LADIES.

NAME.	COURSE.	RESIDENCE.
Baker, Kittie M	Literature and Science	Champaign.
Barnes, Bertha E	Literature and Science	Champaign.
Davis, Marietta	Literature and Science	Monticello.
Elder, Loretta K	Literature and Science	Mattoon.
*Elliott, Elsie C	Literature and Science	Tonica.
Hammett, Jennie M	Natural History	Camargo.
Lawhead, Lucie M	Literature and Science	Champaign.
Lawrence, Nettie E	Literature and Science	Belvidere.
Macknet, Metta M. I	Literature and Science	Girard.
Thomas, Darlie	Literature and Science	Champaign.
Wright, Jessie A	Literature and Science	Champaign

JUNIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
*Bacon, Theodore H	Civil Engineering	Champaign.
*Bowen, Aaron L	Mechanical Engineering	Savanna.
Bridge, Arthur M	Lit. and Science and Military	LaMoile.
*Bringhurst, Henry W	Civil Engineering	Logansport, Ind.
*Bullard, Benj. F	Literature and Science	Mechanicsburg.
Bullard, George W	Architecture	Mechanicsburg.
Carman, William B	Chemistry and Military	Champaign.
*Clay, John R	Mechanical Engineering	Cobden.
Cole, Edward E	Lit. and Science and Military	Champaign.
*Craig, William P	Literature and Science	Champaign.
Curtiss, William G	Agriculture	Warren.
Davis, Jeptha H	Literature and Science	Monticello.
Eaton, William T	Civil Engineering	Warrensburg.
Eichberg, David	Lit. and Science and Military	Atlanta.
Eisenmayer, Andrew J	Mech. Engineering and Mil	Trenton.
French, George H	Civil Engineering	Milton.
*Harrison, Samuel A	Lit. and Science and Military	Upper Alton.
Huey, Joseph D	Natural History	Clement.
Lewis, Ralph D	Literature and Science	Utica.
*Maltby, Frank B	Mechanical Engineering	Champaign.
Merritt, Charles H	Natural History	Waterman.
Mohr, Louis	Mech. Engineering and Mil	Chicago.
Neely, John R	Lit. and Science and Military	DuQuoin.
*Noble, Thomas	Chemistry	Todd's Point.
Orr, Robert E	Civ. Engineering and Military	Champaign.
Palmer, Charles W	Literature and Science	Watseka
Peabody, Arthur	Architecture	Champaign.
Reed, Howard	Agriculture and Military	Galesburg.
Richards, George W	Mining Engineering and Mil	Quincy.
Roberts, Charles N	Mechanical Engineering	Jefferson.
Rugg, Frederic D	Literature and Science	Champaign.
Sharpe, Abia J	Mech. Engineering and Mil	East Lynne, Mo.

NAME.	COURSE.	RESIDENCE.
Shlaudeman, Frank	Mechanical Engineering	Decatur.
Slauson, Howard	Chemistry	Bloomington.
Smith, Charles L.	Lit. and Science and Military	Champaign.
Spencer, Nelson S.	Architecture	Dixon.
Taft, Florizel A.	Natural History	Champaign.
Todd, James	Mechanical Engineering	Elgin.
Turner, Herbert,	Agriculture and Military	Quincy.
Wadsworth, John G.	Lit. and Science and Military	Madison, Dakota.
Williams, Alfred H.	Agriculture	Moline.

LADIES.

NAME.	COURSE.	RESIDENCE.
Andrus, Dora	Literature and Science	Ashton.
Avery, Kittie Clyde	Literature and Science	Champaign.
Cole, Fronia R.	Literature and Science	Champaign.
Hall, Lucy A.	Literature and Science	Champaign.
Hammond, May E.	Chemistry	Ludlow.
*Victor, Mary F.	Literature and Science	Champaign.

SOPHOMORE CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Edward L.	Civil Engineering	Union Grove
Aherin, Thomas	Chemistry	Girard.
Alison, John W.	Literature and Science	Bismark.
Alling, Charles A.	Civ. Engineering and Military	Champaign.
*Andrews, William T.	Mechanical Engineering	Williamsport, Pa.
Armstrong, Charles G.	Chemistry	Seneca.
Atkinson, Frank E.	Civil Engineering	Harrison.
Bailey, Samuel G.	Chemistry and Military	Chicago.
Bartlett, Benj. W. A.	Architecture	Des Moines, Iowa.
Bogardus, Charles E.	Chemistry	Champaign.
Bogardus, Edward F.	Elective	Champaign.
Booth, Christopher S.	Literature and Science	Columbus.
Brainard, Clarence	Civil Engineering	Buda.
Brady, Clarence E.	Literature and Science	Hardie.
Burt, Frank S.	Literature and Science	Urbana.
Chapman, N. Ward	Civil Engineering	Gerlaw.
Christie, George M.	Mining Engineering	Atlanta.
Diffenbaugh, Harry	Chemistry	Dwight.
Donovan, John L., Jr.	Literature and Science	Wateska.
Dorsey, Richard E.	Literature and Science	Gillespie.
Dougherty, Marcus L.	Literature and Science	Mason City.
*Ells, Charles E.	Mechanical Engineering	Champaign.
Gates, Alphonso S.	Civil Engineering	Hamilton.
Goltra, William F.	Civ. Engineering and Military	Bourbonnais.
Gray, Nelson A.	Lit. and Science and Military	Champaign.

NAME.	COURSE.	RESIDENCE.
Haas, Solomon I	Architecture	Savanna.
Haven, Dwight C	Lit. and Science and Military	New Lenox.
Heath, William A	Literature and Science	Champaign.
Hewes, George C	Chemistry	Farmer City.
Hewins, Charles F	Literature and Science	Loda.
Hubbell, Charles H	Civ. Engineering and Military	Altona.
Hudgens, Dana	Mech. Engineering and Mil	Sandwich.
Kemman, Alphonso	Agriculture	La Grange.
Kenower, John T	Chemistry	Clement.
Little, Henry P. T	Literature and Science	Urbana.
McCune, Henry L	Lit. and Science and Military	Ipava.
*Magoon, William H	Literature and Science	Champaign.
*Miles, William L	Agriculture	Princeton.
Moore, William D	Mechanical Engineering	Chatham.
North, Foster	Natural History	Kewanee.
Nungesser, John	Chemistry	Mascoutah.
Palmer, Arthur W	Chemistry	Springfield.
Piatt, Silas H	Agriculture	Monticello.
Postel, Julius	Literature and Science	Mascoutah.
Scotchbrook, Geo. P	Civil Engineering	Morrison.
Shaw, Alvin A	Literature and Science	Annawan.
Singer, William A	Chemistry	Peoria.
Sondericker, William	Literature and Science	Woodstock.
Stevenson, Arch. A	Mechanical Engineering	Rock Island.
Swasey, Edward H	Literature and Science	Belvidere.
Tinkham, Michael D. C	Chemistry	Homer
Tunnell, David B	Mechanical Engineering	Wyandotte, Kan.
Warrington, James N	Mechanical Engineering	Chicago.
Weis, Joseph	Chemistry	Tonica.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ashby, Lida M	Literature and Science	Champaign.
Boggs, Hattie M	Literature and Science	Tuscola.
Campbell, Juniata G	Literature and Science	Polo.
Carman, Ellen M	Literature and Science	Champaign.
Coddington, Hester	Literature and Science	Champaign.
*Conkling, Anna J	Literature and Science	Champaign.
Fellows, Clara B	Literature and Science	Farmer City.
Gardner, Jessie	Literature and Science	Champaign.
Healey, Grace	Literature and Science	Champaign.
Howell, Lemira H	Literature and Science	Champaign.
Johnson, Jessie G	Elective	Urbana.
Knowlton, Lizzie A	Literature and Science	Urbana.
Langley, M. Celeste	Literature and Science	Champaign.
Lewis, C. Florence	Literature and Science	Farmer City.
McNeil, Mary A	Literature and Science	Pinckneyville.
Maltby, Helen E	Literature and Science	Champaign.
Moore, C. Belle	Literature and Science	Champaign.

NAME.	COURSE.	RESIDENCE.
Peabody, Kate F	Literature and Science	Champaign.
Raley, Arvilla K	Literature and Science	Granville.
Ranney, Frances L	Elective	Cazenovia.
Ross, Della	Literature and Science	Avon.
Smith, Laura B	Literature and Science	Champaign.
Stewart, Ella M	Literature and Science	Champaign.
Wright, Minnie E	Literature and Science	Champaign.

FRESHMAN CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Allen, E. Wright	Agriculture	Harristown.
Austin, James	Civil Engineering	Altona.
Ayers, Judson F.	Chemistry	Urbana.
Babcock, Guy H	Agriculture and Military	Ridott.
Bacon, George H.	Literature and Science	Champaign.
Baner, Frank A	Civil Engineering	Mason City.
Barber, Henry H.	Civ. Engineering and Military	Savanna.
Bartholf, Emmett G	Literature and Science	Plainfield.
Bartholf, William J.	Literature and Science	Plainfield.
Bills, Frank L.	Literature and Science	Garden Prairie
Boller, Chester E.	Architecture	Lexington.
Braucher, Arthur C	Civil Engineering	Lincoln.
Braucher, William B.	Mechanical Engineering	Lincoln.
Brown, Charles P	Literature and Science	Monticello.
Brown, George M	Mech. Engineering and Mil.	Dixon.
Burt, Angelo R	Mechanical Engineering	Dubuque, Iowa.
Burton, James G	Literature and Science	Arcola.
Carman, John C	Literature and Science	Champaign.
Carse, David	Chemistry	Chicago.
Casely, William J. C.	Chemistry	Marengo.
Colton, Seth W	Elective	Princeton
Crandall, Frederic A.	Literature and Science	Loda.
Cummings, Harvey D	Literature and Science	Buda.
Doering, Chase	Literature and Science	Central City.
Dunlap, Robert L	Chemistry	Savoy.
Durfee, Elisha B	Literature and Science	Marion.
Dustin, William L.		Lincoln.
Eberlein, Frederic W	Chemistry	Champaign.
Eliel, Albert L	Mech. Engineering and Mil.	LaSalle.
Eyman, Isaac R	Agriculture	Belleville.
Gale, Walter H.	Elective	Oak Park.
Gregory, Grant	Literature and Science	Champaign.
Harkness, Henry H.	Civil Engineering	Oak Park.
Herdman, Frank E	Mech. Engineering and Mil.	Zanesville, Ohio.
Hermann, David	Civil Engineering	Highland.
Howard, Homer D	Literature and Science	LeRoy.

NAME.	COURSE.	RESIDENCE.
Huntley, Converse R.	Chemistry	DeKalb.
Jaquett, Frederic C.	Mechanical Engineering	Champaign.
Kimball, Edwin R.	Chemistry and Military	Champaign.
Lilly, Charles H.	Chemistry and Military	Champaign.
Lilly, James E.	Literature and Science	Champaign.
Lindley, Elmer E.	Chemistry	Urbana.
McCluer, George M.	Elective	Farina.
McCoy, Joseph S.		French Grove.
McKown, William N.	Chemistry	Altona
Marshall, John H.	Literature and Science	Charleston.
Meriwether, Edward G.	Agriculture	Shipman.
Miller, John A.		Buffalo, N. Y.
Morgan, George N.	Literature and Science	Kinmundy.
Nelson, Harry A.	Mechanical Engineering	Oneida.
Norman, Charles C	Elective	Carlyle.
Odell, Arthur M.	Civil Engineering	East Dubuque.
Page, Milo K.	Chemistry	Metamora.
Peart, George K.	Civil Engineering	Braidwood.
Philbrick, Solon	Literature and Science	Baileyville.
Pierce, Fred	Chemistry and Military	Polo.
Randolph, Thurston F.	Chemistry	Canton.
Read, Harry J	Civil Engineering	Chicago.
Roberts, Lewis C.	Elective and Military	Jefferson.
Rohrbough, Levi C.	Literature and Science	Kinmundy.
Rollins, G. Edward	Chemistry	Kewanee.
Shurtleff, Charles W.	Elective	Genoa.
Sim, Benjamin F.	Mining Engineering	Urbana.
Simmons, George E.	Mining Engineering and Mil.	Avon.
Sizer, Lucius N.	Lit. and Science and Military	Mahomet.
Smalley, Francis A.	Literatnre and Science	Girard.
Smead, William H	Literature and Science	Winnebago.
Smith, Tracy A.	Elective	Wilmington.
Speidel, Ernst	Chemistry	Rock Island.
Spencer, Howard M.	Mechanical Engineering	Dixon.
Stannard, Albert C.	Chemistry and Military	Urbana.
Starr, Nathan		Paris.
Stevens, Hubert A.	Civil Engineering	Chicago.
Swarth, Charles J.	Elective	Chicago.
Thorp, E. M.	Literature and Science	Wapella.
Townsend, Harry F.		Avon.
Van Petten, Henry S.	Natural History	Chillicothe.
Vial, Edmund R.	Agriculture	Western Springs.
Wells, Frank P.		Decatur.
West, Charles H.	Civil Engineering and Mil.	Greenville, Miss.
Whittemore, Benj. M.	Lit. and Science and Military	Charleston.
Wills, Jerome G.	Literature and Science	St. Paul.
Wilmot, Frank L.	Chemistry	Lawn Ridge.
Womacks, Wilson E.	Literature and Science	Champaign.
Wright, Robert W.	Literature and Science	Belvidere.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayers, Nettie	Literature and Science	Urbana.
Barber, Ella U	Literature and Science	Champaign.
Braucher, Alma E	Natural History	Lincoln.
Brown, M. Linnie	Literature and Science	Paris.
Clark, Lucy J	Natural History	Champaign.
Ellis, Lola D	Literature and Science	Canton.
Everett. M. Kate		Champaign.
Fairchild, Grace	Literature and Science	Metamora.
Fuller, Ruth W.	Literature and Science	Hingham, Mass.
Hall, Nira May		Metamora.
Hays, Gertrude	Literature and Science	Urbana
Heidenheimer, Ida	Literature and Science	Chicago.
Heislar, Lulu	Literature and Science	Urbana.
Hill, Cora J	Literature and Science	Paxton.
Kemball, Georgetta	Literature and Science	Champaign.
Krause, Josephine	Literature and Science	Chicago.
Lewis, Georgetta L	Literature and Science	Champaign.
Little, Cora G	Elective	Urbana.
Morris, Ida M.		Pesotum.
Nash, Alida L.	Literature and Science	Urbana.
Pendleton, Clara L	Literature and Scienee	Chenoa.
Randolph, Flora F		Canton.
Rush, Ida F		Champaign.
Scoggin, M. Alice	Literature and Science	Champaign.
Shaw, Anna B	Literature and Science	Tremont.
Shaw, Jessie S	Natural History	Kankakee.
Sim, Kitturah E	Literature and Science	Urbana.
Somers, Cora	Literature and Science	Urbana.
Wells, Anna L	Elective	Western Springs.
Wilson, Rachel S.	Literature and Science	Paris.
Zipf, Delia	Natural History	Kankakee.

PREPARATORY CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Barmm, Charles E.	Mechanical Engineering	Chicago
Bassett, Owen B	Agriculture	Dana.
Baxter, Thomas L.		Chicago.
Blain, James M.		Champaign.
Blodgett, Delbert	Agriculture	Western Springs.
Brinkman, Edward	Chemistry	Edwardsville.
Brown, Edward F	Mechanical Engineering	Evanston.
Burroughs, Joseph V	Mechanical Engineering	Decatur.
Claflin, Charles	Mechanical Engineering	Champaign.
Clark, William B		Worthington, Pa.
Clymer, Glasgo D	Chemistry	Seneca.

NAME.	COURSE.	RESIDENCE.
Cole, T. Edward	Elective	Champaign.
Cook, Curtin		Tolono.
Crissey, Herbert G	Chemistry	Avon.
Dole, Charles E	Civil Engineering	Mattoon.
Dorsey, Plutarch H		Bunker Hill.
Ellis, George H	Chemistry	Milwaukee, Wis.
Garman, Jerome C	Architecture	Urbana.
Halberstadt, D. E		Urbana.
Hawkins, William A	Literature and Science	Ridott.
Holden, Nathan E		Danville.
Holmes, Thomas J	Chemistry	Aledo.
Huber, Otto		Rock Island.
Ivey, John J	Mechanical Engineering	Little York.
Jenkins, David	Civil Engineering	El Paso.
Johnston, William	Chemistry	Carlyle.
Kammann, Charles H	Elective	Mascoutah.
Kell, John M	Chemistry	Carlyle.
Kemman, Alveno F	Mechanical Engineering	La Grange.
Krause, Frederic F	Mining Engineering	Chicago.
Lantz, Milo P		Oak Grove.
Lawrence, Philip E	Literature and Science	Galesburg.
Lietze, Frederic A	Civil Engineering	Carlyle.
McCoy, John		Little York
McClaren, Joshua		Carlyle.
McCrea, Charles F	Literature and Science	Logansport, Ind
McEathron, William J	Civil Engineering	Lena.
McIntyre, William J	Civil Engineering	Chebanse.
Marshall, Sherman L	Literature and Science	Ipava.
Mathers, George B	Agriculture	Mason City.
Meriwether, Alfred P		Shipman.
Moffett, John B	Literature and Science	Decatur.
Moffett, William D	Civil Engineering	Decatur.
Montezuma, Charles	Chemistry	Urbana.
Morse, Leland		Cazenoria.
Mortland, John F	Literature and Science	Hardin.
Muns, Andrew C		Parkville.
Newport, Charles L		Champaign.
Noble, John		Todd's Point.
North, Arthur T		Kewanee.
Parish, George C		Litchfield.
Peterson, Harry G		Champaign.
Petty, George R	Mechanical Engineering	Pittsfield.
Piety, Myron N	Literature and Science	Urbana.
Piety, Samuel	Literature and Science	Urbana.
Reynolds, Henry L		Camp Point.
Richards, Albert L		Burton.
Ronalds, Hugh L	Mechanical Engineering	Grayville.
Russell, Charles M		Urbana.
Schaub, Edward L. T		Columbus, O.
Schrader, Alfred C	Civil Engineering	New Lenox.

NAME.	COURSE.	RESIDENCE.
Scott, John K		Champaign.
Smith, George	Literature and Science	Iliopolis.
Stewart, Walter N		Champaign.
Stone, John F	Agriculture	Mason City.
Stratton, Samuel W	Mechanical Engineering	Litchfield.
Taggart, James S	Agriculture	Ridott.
Taylor, John F	Civil Engineering	Taylor.
Vial, Frederic K	Agriculture	Western Springs.
Walter, Wayne M	Architecture	Medora.
Wilcox, Alfred R	Literature and Science	Minonk.
Woodworth, George E	Elective	Chicago.
Wright, John E	Literature and Science	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Avery, Minnehaha		Champaign.
Lowry, Susie		Monticello.
Porterfield, Carrie F	Literature and Science	Sidney.
Thomas, Fannie		Kickapoo.

SPECIAL STUDENTS.

NAME.	RESIDENCE.
AGRICULTURE.	
Brenneman, Edward	Peru.
Hicks, A. William	Warren.
Hunt, Thomas F	Ridott.
Rosensteel, Jerome I	Freeport.
DRAWING AND PAINTING.	
Allen, Aleck M	Bradford, Pa.
Chase, Morton E.	Champaign.
Dunlap, Lillian	Savoy.
Hall, Sylvia H	Charleston.
Thayer, George H	Winnebago.
PAINTING.	
Ricker, Mrs. N. C	Champaign.
Scovel, Mrs. M. A	Champaign.

SUMMARY.

	GENTLEMEN.	LADIES.	TOTAL.
Seniors	39	11	50
Juniors	41	6	47
Sophomores	54	24	78
Freshmen	85	31	116
Preparatory	73	4	77
Special	7	4	11
Total	299	80	379

Illinois Industrial University.

HISTORY.

THE Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main Building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, till four Colleges, including ten distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1599. The number graduated from the several Colleges, including the class of 1880, is 257. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1878 its exhibit at the Paris International Exposition gained the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The county is a region of beautiful rolling

prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments embraces about 623 acres, including stock farm, experimental farm, orchards, gardens, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building for public use, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and an ample green-house.

The Mechanical Building and Drill Hall is of brick, 126 feet in length and 88 feet in width. It contains a boiler, forge and tank room; a Machine Shop, furnished for practical use, with a steam engine, lathes, and other machinery; pattern and finishing shop, shops for carpentry and cabinet work, furnished with wood-working machinery; paint and draughting-rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also well supplied with gymnastic apparatus. One of the towers contains an armorer's shop and military model room, an artillery room and a band room. The other contains a printing office and editor's room.

The Chemical Building, erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 25,000 acres of well-selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and county bonds amounting to $319,000, besides other property and avails, valued at $33,000. The State has appropriated $25,000 to the Agricultural Department for barns, tools, stock, etc.; $25,000 to the Horticultural Department for green-house, barns, drainage, tools, trees, etc.; $25,000 for Mechanical and Military Building, machinery, etc.; $127,000 toward the erection of the Main Building, and furnishing the same; $10,500 for Chemical Apparatus; $25,000 for Library; $5,000

for the Apparatus of a Physical Laboratory; $3,000 for a Veterinary Hall, Stable, and Apparatus; $40,000 for a Chemical Building; besides smaller amounts for agricultural experiments, etc.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich and equalled at few, if any, of the colleges of the west. Among these collections are included the following:

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles, and mammals, from the oldest paleozoic time to the present. Also a fine set of fossils obtained from Germany, besides collections of fossils of this and other States, well illustrating the different formations, and suitably arranged for practical study.

Conchology.—A large collection of shells fully illustrating the principles of conchology as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals, with the single exception of the order of proboscidea; also typical representatives of the amphibious reptiles and of fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivors and fur bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is very large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders, and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets

of the grasses and sedges. There are besides many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc.

A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees and shrubs of Stephenson County, Illinois, are represented by a distinct collection.

Plaster casts of fruits represent many of the leading varieties, as well as interesting specimens, showing peculiarities of growth, effects of cross fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized; these, with a complete set of imported models, fully illustrate crystallography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, costing over $5,000, and illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, drill presses, and the requisite hand tools, benches, vices, anvils, etc., for pattern shop, blacksmith shop, moulding room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work shops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, at a cost of $2,000, illustrating sections of mines, machinery for elevating and breaking ores, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture, it embraces thirteen full size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 12,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading room, is open throughout the day for study, reading, and consultation of authorties. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study encouraged or required. The reading-room is well provided with American, English, French, and German

papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received :

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Rural New Yorker.
Country Gentleman.
Indiana Farmer.
New England Farmer.
Farmer and Fruit Grower.
Agricultural Gazette, *London.*
Gardner's Chronicle, *London.*
Journal d'Agriculture Pratique, *Paris.*
Revue Horticole, *Paris.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal.
Horticulturist.
Western Farmer.
Wallace's Monthly.
Farmers' Review.
Veterinary Journal.
Recneil de Medicine Veterinaire, *Paris.*

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Engineering, *London.*
Building News, *London.*
Builder, *London.*
Skizzen-buch, *Berlin.*
Scientific American.
Engineering News.
Engineering and Mining Journal.
Scientific American Supplement.
VanNostrand's Engineering Magazine.
The Workshop.
American Architect.
Western Manufacturer.
Gazette of Patent Office.

SCIENTIFIC.

Annales des Sciences Naturelles, *Paris.*
Nature, *London.*
Grevillea, *London.*
Comptes Rendus, *Paris.*
La Lumiere Electrique.
American Journal of Pharmacy.
Transactions American Society of Civil Engineers.
The Druggist.
Chemical News, *London.*
American Journal of Chemistry.
Polytechnisches Journal, *Augsburg.*
Jahrbericht der Chemie, *Giessen.*
Annalen der Chemie, *Leipsic.*
Berichte der Dentschen Chemischen Gesellschaft, *Berlin.*
Sanitarian.
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
American Naturalist.
Journal of Franklin Institute.
Mathematical Quarterly.

LITERARY AND NEWS.

New Englander.
International Review.
Edinburg Review.
London Quarterly Review.
British Quarterly Review.
North American Review.
Atlantic Monthly.
Scribner's Monthly.
Library Journal.
Literary World.
American Jonrnal of Philology.
American Journal of Education.
Education.
Magazine of American History.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Dentsche Rnndschau, *Berlin.*
Princeton Review.
Stoddart's Review.
United Service Magazine.
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign County Republican.
Champaign Times.
Paxton Record.
Musical Record.
Signal.

The exchanges of the *Illini*, over thirty in number, are also free to the students in the Library.

AIMS OF THE UNIVERSITY.

The University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the State may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress*, *1862*, *Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships, as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly*, *1867*, *Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges,

which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.

School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages. School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, Elocution, and Photography are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

It has been a favorite aim of the University from the outset, to allow as much freedom as possible in the selection of studies.

A University is designed not for children, but for men and women, who may claim to know something of their wants, powers, and tastes. It is not useful to require every student, without regard to his capacity or practical wants, to take entire some lengthened "course of study." Each student should weigh carefully his own powers and needs, and counsel freely with his teachers as to the branches he may need to fit him for his chosen career, and then should pursue them with earnestness and perseverance, without faltering or fickleness.

It is necessarily required:—that the student shall be thoroughly prepared to enter and keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of studies prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies can be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physical Geography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectual Drawing and Designing, Elements of Construction, Graphical Statics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, the day previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as though as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and Composition. These are required in addition to 1 and 2 for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy, Latin Grammar and Reader. Cæsar, Cicero, Virgil and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammer and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, in addition to 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of adm ssion, see "*Admission*" under the several Colleges; also "*Preliminary Year*."

COUNTY SUPERINTENDENT'S CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examinations of candidates in the four common branches, Arithmetic, Geography, English Grammar, and History of the United States; those who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

COLLEGE OF AGRICULTURE.

SPECIAL FACULTY.

The REGENT.

Professor MORROW, Dean,	Professor PRENTICE,
Professor BURRILL,	Professor SCOVELL,

C. I. HAYS.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing,

of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming—of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm; its improvement by mechanical means, as Drainage and Irrigation; its Divisions, Fences, Hedges, etc.; its Water Supply; the construction of Roads; arrangement, planning and construction of Farm Buildings; the construction, selection, care, and use of Farm Implements and Machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and other countries. Influence of climate, civilization and legislation in advancing or retarding. Agricultural Literature and Organizations.

Rural Law.—Business Law; Laws especially effecting Agriculture—tenures of Real Estate; Road, Fence, Drainage Laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: Orchard Sites, the Age of Trees to Plant, the Season to Plant, How to Plant, What to Plant, the Management of the Soil, Pruning and Care of Trees, Gathering and Preserving Fruit, Diseases and Injuries, the Nursery, Ornamental Trees and Shrubs, Flower Gardens, Vegetable Gardens, including Propagating Beds and Houses, the Vineyard and Small Fruits, and Timber Tree Plantations. Students have instruction and practice in grafting, budding, propagation by cutting, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions, of all prominent objects, including the kinds and groups

of trees and other plants. These plans with specifications, are to be deposited in the library of the College. Excursions are made when found practicable for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for specially horticultural pursuits and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth, or abundance of flowers, are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is had in making drawings and plaster casts. Written discriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classifications are put to practical test. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Pruning and training by various methods, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Plant Houses and Management.—This study includes garden and landscape architecture, the methods of construction, heating and ventilation and general management, so as to secure, under the different circumstances, the best plant growth. The classroom work consists of lectures and architectual designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the Domestic Animals is taught by lectures, demonstrations and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are also given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the agticultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines; their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and Special Investigations by each student. A Thesis is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoölogy, Entomology, Geology and Meteorology, see statements in College of Natural Science.

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, and several breeds of swine, to illustrate the problems of breeding

and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture under the direction of the Professors of Agriculture and of Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultnral science.

The Barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The Barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large wind-mill, which furnishes power for grinding feed, and for other purposes.

A Veterinary Hall and Stable has been provided, and a Clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux' celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and teeth of the horse at different ages.

Surveying and Drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College, there are: 1. A very large specimen apple orchard planted in 1869, and containing above 1,000 varieties,—many varieties of pears, cherries, grapes, and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An aboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different material and styles of laying out, give

illustration to the class-room work in landscape gardening. A spacious green-house, recently much enlarged, contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture: Chemistry; Trigonometry; Shop Practice (optional).
2. Elements of Horticulture; Chemistry: American Authors, or Free Hand Drawing.
3. Vegetable Physiology: Chemistry: Rhetoric.

SECOND YEAR.

1. Agricultural Chemistry, (Soils and Plants); Botany: German.
2. Agricultural Chemistry (Tillage, Fertilizers, Foods); Botany: German.
3. Economic Entomology; Zoology: German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Geology or Ancient History.
2. Animal Husbandry: Veterinary Science: Physics or Mediæval History.
3. Landscape Gardening: Veterinary Science: Physics or Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography: Mental Science: History of Civilization.
2. Rural Economy; Constitutional History: Logic.
3. History of Agriculture and Rural Law; Political Economy: Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on page 30.

FARMER'S COURSE.

Students who cannot give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Practical Entomology or Landscape Gardening.

COLLEGE OF ENGINEERING.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean.
PROFESSOR SHATTUCK,
E. A. KIMBALL.
PROFESSOR BAKER,
PROFESSOR ROOS,
J. SONDERICKER,

SCHOOLS.

MECHANICAL ENGINEERING, ARCHITECTURE,
CIVIL AND MINING ENGINEERING.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their courses more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

French and German are pursued at least one year each. Some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previons study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a textbook, and the drawings made on smooth paper, eight by ten inches.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises:

For manuscripts and unimportant drawings, a heavy flat-cap paper. For ordinary drawings, not colored, a heavy, first quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings, and lettering, the best three-sheet Bristol board.

For problems, exercises, lecture notes, theses and other manuscripts, and for geometrical projection, topographical, railroad, typographical and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used it must be cut 8x10 inches, and the binding margin hinged on with muslin.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labeled with the donors' names, and placed in the cabinets of the College for the inspection of students and the illustration of lectures.

THESES.

In all the schools of this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink, or colors. It must be upon regulation paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the library of the University.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design,

construct, and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory, is counted as one of the studies of the course.

In PRINCIPLES instruction is imparted by lectures, illustrated plates, and by text books. Examples are given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In PRACTICE elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In DESIGNING the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron and wood; with the form and condition for most effective work; with the machines and appliances by which they are put into action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents four different shops, viz.:

1—PATTERN MAKING.

2—BLACKSMITHING.

3—BENCH WORK FOR IRON.

4—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists in planing, turning, chiseling. etc., in producing true surfaces of various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct

pattern making. Patterns are finally made, from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops,

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, there is first a course of free-hand bench work, the cold-chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 4th shop the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, disks, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Lectures are given in which the most favorable forms and manipulation of cutting tools and auxiliary appliances are explained.

Previous to the shop work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation. The following is a detailed view:

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction

and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections; their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane, area, surface, and volume of revolution.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolutions.

SECOND YEAR.

Advanced Algebra.—Binomial theoem; properties and summation of series; exponential quantities; logarithms; general theory and methods of solving equations.

Advanced Analytical Geometry.—General discussion of the equation of the second degree; loci in space; the point, right line, and plane; curved surfaces; loci of higher orders; the spirals, logarithmic curve, trochoids, cissoid, etc.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications.

PHYSICS.

The course in Physics is complete and thorough, embracing the four kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is amply provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, optics and electricity from Stoehrer, of Leipsig, and Browning and Newton, of London; pneumatic and electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Bros., London, resistance coils, galvanometers, etc., for higher researches in electricity.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and noncircular wheels in rolling contact, cams and curves in sliding contact ; gear teeth ; gearing chains; escapements; link work.

Analytical Mechanics.—Equations of equilibrium; movements; virtual velocities; centers of gravity; mechanical powers; friction; dyamics.

Hydraulics.—Amount and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains.

Resistance of Materials.—See School of Civil Engineering.

Prime Movers.—The theory and useful effects of turbine water wheels, and best form of the parts for high efficiency. Other water-wheels and wind-wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill-work and Machinery.—Trains of mechanism, studied with reference to their resistence and efficiency; best forms for transmission of power for short and great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective.

Free-hand Drawing.—Sketches of machinery; ornamentation; lettering.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line-shading; details for shop use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, reduce them to neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require executions in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the mechanical laboratory and in factories in the adjoining towns, and determine from them the power developed with different de-

grees of expansion, and the possible defects of valve movement in distribution of steam.

In strength of materials the student determines the modulus of rupture and the coefficient of elasticy of several kinds of building material. In hydraulics the flow of water through orifices of different form, is studied experimentally. In mechanism each student solves an original problem involving mechanical movements.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop furnished with complete sets of tools, benches, vises, and forges.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry: Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Free Hand Drawing; Shop Practice; French.

SECOND YEAR.

1. Designing and Construction of Machines; Advanced Algebra; German.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German.
3. Advanced Calculus; Astronomy; German.

THIRD YEAR.

1. Mechanism and Mechanical Laboratory; Advanced Descriptive Geometry; Chemistry and Laboratory Practice.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Modern History; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geology; Mental Science.
2. Prime Movers; Constitutional History; Construction Drawing.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The School is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable students to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text-books, and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges; and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid any interference of hours of recitation and because the studies are there given in that order which best meets the preparation of the student.

NATURAL SCIENCE.

Physics—See School for Mechanical Engineering. *Chemistry*—Inorganic chemistry and qualitative analysis. *Geology*—Elements of physiographical, lithological, historical, and dynamical geology.

DRAWING.

Projection Drawing—Use of Instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades, shadows, and perspective; drawings finished in colors and by right-line shading; bridges; right and oblique arches. *Free Hand*—Landscapes; buildings; lettering and ornamental work. *Topographical*—Sketching; ink drawings, conventional signs, etc. *Mapping*—Railroad, city, and county maps. *Architectural*—Designing and drawing of engineering structures.

TECHNICAL STUDIES.

Astronomy—Descriptive Astronomy is given by lectures with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the astronomical transit, sextant, and engineer's transit adapted to astronomical work, and by astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges—Calculation of the strains in the king post, queen post, Warren's, Howe's and other trusses, by analytical and graphical methods; and the designing of bridge and roof trusses.

Descriptive Geometry—Problems on the point, right-line and plane; warped surface; perspective; shades and shadows; practical problems.

Geodesy—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; magnetic elements; figure of the earth; projection of maps.

Hydraulics and Mechanics—See School of Mechanical Engineering.

Land Surveying—Areas; distances; omissions and corrections; metrical system; methods of U. S. public land surveys.

Mathematics—For pure Mathematics see School of Mechanical Engineering.

R. R. Surveying—Economic location; curves; turnouts; crossings; slope stakes; earthwork; grades; curvature of rails; coning of wheels.

Strength of Materials—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Stone Work—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topographical Surveying—Stadia; plane table; level; contours; soundings, etc.

Theory of Engineering Instruments—Examination of workmanship and design; testing instrument maker's adjustments; engineer's adjustments.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topographical survey of a locality is made by the class, in which the stadia and plane-table are used as in the United States surveys.

In the fall term of the third year, the class will execute a project in railroad engineering, which will consist of preliminary surveys, location, staking out, drawings, computations of earthwork, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, ete. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering, will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice—The school is well provided with the instruments necessary for the different branches of engineering field practice, which includes chains, tapes, compasses, plane-tables, stadias, transits, levels, barometer for barometrical leveling, base rods, and comparing apparatus, sextants, engineer's transits, arranged for astronomical observations, and an astronomical observatory, which is provided with an equatorial telescope, an astronomical transit, zenith telescope, chronometer, and a set of meteorological instruments. To facilitate the practice in trigonometrical and land surveying, it has a specially prepared area,

in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including descriptive geometry, astronomy, models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photo-lithographs of bridges, roofs, and engineering structures; it has access to the cabinet of the college of engineering, which contains models illustrating wood, stone, and metal construction, and a complete set of lithographs of the lectures and drawings used in the government Polytechnical Schools of France.

The library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; French.
3. Calculus; Free-Hand Drawing; French.

SECOND YEAR.

1. Advanced Algebra; Land Surveying; German.
2. Advanced Analytical Geometry; Theory of Instruments and Surveying; German.
3. Advanced Calculus; Topographical Surveying and Drawing; German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry and Laboratory Practice; Railroad Engineering.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Mental Science; Geodesy and Practical Astronomy.*
2. Bridges;* Constitutional History; Geology.
3. Stone Work; Political Economy; Bridge Construction.*

MINING ENGINEERING.

Students in Mining Engineering will take the course in metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores, and

rocks. In the Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces, and other apparatus required for practical instruction in this department.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The School prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

INSTRUCTION.

The course embraces the knowledge of theory and principles, of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with references to text-books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work are executed, also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

The course in mathematics, mechanics, physics, etc., is nearly identical with that in the other schools of engineering.

TECHNICAL STUDIES.

Drawing from Casts—Outline sketches and finished drawings in pencil, crayon, and charcoal.

Modeling in Clay—From casts and original designs; weekly exercises in designing architectural ornaments.

Elements of Construction—Lectures; designs for specified problems.

Wood Construction—Frames, roofs, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating, Plastering, Painting, and Plumbing.

Architectural Drawing—Ornaments, moulding; finishing in ink, sepia, and color; working out full sets of drawings for buildings from sketches; practical perspective, and shades and shadows.

Architectural Designing—Original sketches for three projects; two full sets of drawings for buildings for specified private or public purposes.

History of Architecture—Daily lectures on principal styles, characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracings of details; designs for special problems.

Esthetics of Architecture—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings, art objects, furniture, carpets, etc. About twenty-five original designs required for specified objects.

Estimates—Method of measurement, cost of labor and materials, estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value and products.

Graphical Statics—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close

of each term in drawing, to form a part of his record. All such papers must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term—Carpentry and Joinery. Planing flat, square, and octagonal prisms and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; mitre, lap and gained joints; through and lap dovetails; mouldings, mitres, and panels.

Second Term—Turning and cabinet making; cylinders, balusters, capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering, inlaying, carving, and polishing.

Third Term—Metal work, pattern making, moulding and casting; filing and finishing, drilling, screws, hand and machine turning.

Stone work, executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details, from Lehr, of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof-trusses and stairs, joints, etc.; Schroeder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws, planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

1. Wood Construction: Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction: Architectural Drawing; Shop Practice (Stair Building).
3. Estimates, Agreements and Specifications, Heating and Ventilation; Architectural Designing; Shop Practice (Cabinet Making).

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Shop Practice; French.

SECOND YEAR.

1. Elements of Construction; Advanced Algebra; Free Hand Drawing and Modeling.
2. Elements of Construction; Advanced Analytical Geometry: Architectural Drawing and Designing.
3. Advanced Calculus; Graphical Statics; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Descriptive Geometry and Drawing; Chemistry and Laboratory Practice.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture: Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing; Constitutional History; Geology.
3. Estimates, Agreements and Specifications, Heating and Ventilation; Architectural Designing; Political Economy.

COLLEGE OF NATURAL SCIENCE.

SPECIAL FACULTY.

THE REGENT.

Professor BURRILL, Dean.
Professor WEBER,
Professor TAFT,
Professor PRENTICE,
H. M. BEARDSLEY.

SCHOOLS.

School of Chemistry. School of Natural History.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in this course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

Text-book instruction in the principles of chemistry and chemical physics occupies six weeks of the first term of the first year. The remainder of the year the recitations alternate with laboratory practice. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses work at least two consecutive hours daily during such time as their specialties may require.

Text-Books—Roscoe's Chemistry; Douglas & Prescott's Analysis; Fresenius' Analysis; Miller's Chemistry; Rose's Analysis.

Books of Reference—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poison.

Four courses of laboratory work have been arranged as follows:

CHEMICAL COURSE.

FIRST YEAR.

First Term.—Qualitative Analysis; Tests and Separation of the Alkalies, Alkaline Earths, $(NH_4)_2S$ Group, and 1st and 2d Divisions of H_2S Group.

Second Term.—Qualitative Analysis Completed: Tests, and Separation of 3d Division of H_2S Group, and the Acids: Analysis of 20 Simple Salts, and 20 Compound Substances.

Third Term.—Qualitative Analysis of Sodium Sulphate, Dolomite, Ammonium, Alum, Potassium Chloride, Bone Ash, Iron Ore.

SECOND YEAR.

First Term.—Quantitative Analysis of Calamite (Zinc Carbonate), Copper Pyrites, Galena, Spathic Iron Ore, Nickel Ore, Clay, Soil; Determination of Iron, Copper, etc., both volumetrically and gravimetrically.

Second Term.—Volumetric Analysis; Alkalimetry and Acidimetry; Preparation of Standard Solutions; Analysis of Sodium Carbonate, Sodium Hydroxide, Potassium Hydroxide, Pearl Ash, Cream of Tartar, Sulphuric, Hydrochloric, Oxalic, and Citric Acids; Analysis of Corn or other Grain.

Third Term.—Preparations of Salts, Acids, etc. Electroplating with Silver, Gold, Copper, Nickel.

THIRD YEAR.

First Term.—Ultimate Analysis; Determination of Carbon, Hydrogen, Oxygen, Nitrogen, Chlorine, Phosphorus, and Sulphur in Organic Compounds: Analysis of Urine.

Second Term.—Blow Pipe Analysis; Determination of a collection of minerals representing over thirty of the Metals: Assaying in both the dry and wet way of Gold, Silver, and Lead Ores.

Third Term.—Photography; Preparation of Ether, Absolute Alcohol, Gun Cotton Cadmium Iodide, Ammonium Iodide, Glacial Acetic Acid, Silver Nitrate, Collodion Taking Negatives, Printing Positives, Toning and Mounting.

FOURTH YEAR.

First Term.—Gas Analysis; Calibration of Eudiometers; Analysis of Air from Lungs, Atmospheric Air, Marsh Gas, Illuminating Gas, and Crude Coal Gas; Analysis o Mineral Waters.

Second Term.—Toxicology; Micro-Chemistry of Poisons: Testing for Mineral and Vegetable Poisons; Separation from Organic Mixtures.

Third Term.—Original Researches.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Commercial Drugs, White Lead, Red Lead, Paris Green, Sodium Nitrate, Oxalic Acid, Tartar Emetic, Commercial Hydrochloric, Nitric, and Sulphuric Acids.

Second Term.—Analysis of Mineral Waters; Preparation of Tinctures. Solid and Fluid Extracts; Reading and Compounding Prescriptions.

Third Term.—Isolation of Alkaloids, Atropine, Strychnine, Quinine, Nicotine, Aconitine, Morphine: Preparation of Salycilic Acid; Examination of Alcoholic Liquors; Reading and Compounding Prescriptions.

THIRD YEAR.

First Term.—Same as second term, second year of Chemical course.

Second Term.—Same as first term, third year of Chemical course, without Analysis of Urine; Reading and Compounding Prescriptions.

Third Term.—Preparation of Salts, Perfumes, Flavoring Extracts, Cosmetics; Electroplating with Gold, Silver, Copper, and Nickel.

FOURTH YEAR.

First Term.—Same as second term, fourth year, of Chemical course.

Second Term.—Analysis of Urine, normal and pathological; Reading and Compounding Prescriptions.

Third Term.—Original Researches.

AGRICULTURAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Feldspar, Soil, Ashes of Plants and Grains.

Second Term.—Analysis of Commercial Fertilizers, Manures, and Minerals used for Fertilizers.

Third Term.—Preparation of Organic and Inorganic Salts: Starch from Potatoes, Corn, Wheat, etc., Sugar, Dextrine, Alcohol.

THIRD YEAR.

First Term.—Same as Chemical course.

Second Term.—Analysis of Milk, Corn, Wheat, Potatoes, Fruits, etc.

Third Term.—Silt Analysis of Soils; Analysis of Mineral Waters.

METALLURGICAL COURSE

FIRST YEAR.

Same as in Chemical course with the Quantitative Analysis of Brass, Solder, and Type Metal in third term.

SECOND YEAR.

First Term.—Same as Chemical course.

Second Term.—Assaying of Gold, Silver, and Lead Ores, both dry and wet ways; Blowpipe Assaying.

Third Term.—Analysis of Malachite, Aznrite, Cinnabar, Tin Ore, Cobalt and Nickel Ore containing Arsenic, Bog Manganese, Grey Antimony.

THIRD YEAR.

First Term.—Analysis of Pig Iron, Wrought Iron, Steel, Furnace Slags, Rolling Mill Slags and Cinders.

Second Term.—Same as in Chemical course, with Analysis of Mineral Waters in place of Assaying.

Third Term.—Same as second term, fourth year, of Chemical course, with Analysis of Coal in place of Mineral Waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institutution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected, at an expense, including furniture, of $40,000.

The basement contains a furnace room for assaying and metallurgical operations; a mill room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood and a wash bowl

with constant supply of water. There are a spectroscope table, a blowpipe table for general use, and a store room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing eight chemical balances of the manufacture of Bunge (Short Beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; a private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, a coil, battery, mercury, etc.; and a store room with apparatus for all kinds of work in quantitative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Dove's polarizer, with a complete suit of accompanying apparatus; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of areometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen; also a potassium dichromate battery, a galvanometer, a spectroscope, and a large binocular microscope; a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry and Laboratory Practice; Trigonometry; British Authors or French.
2. Chemistry and Laboratory Practice: Analytical Geometry; American Authors or French.
3. Organic Chemistry and Laboratory Practice: Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

1. Agricultural Chemistry; Laboratory Practice; Physiology or Botany; German,
2. Agricultural Chemistry; Laboratory Practice; Microscopy; German.
3. Laboratory Practice; Zoology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy: German.
2. Laboratory Practice; Physics: German.
3. Laboratory Practice: Physics; German.

FOURTH YEAR.

1. Laboratory Work; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; Laboratory Work; Logic.
3. Political Economy; Geology; Laboratory Work.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's "Lessons in Botany," or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the second year, systematic and structural Botany is continued by illustrated lectures and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, are deposited in the library of the Laboratory. Each student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's) is required. Microscopes and other apparatus are furnished by the University, for which a deposit of three dollars is required, but no charge is made except for damage and material used. The first six weeks are devoted to the study of the natural orders of

flowering plants. About twelve lectures are given upon the characteristics of the prominent orders—their geographical distributions, importance, etc., together with the history of a few special plants and their products. During this time, two hours per day, three days per week, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramínæ, etc., especially such as are best obtained in Autumn. The seventh week is devoted to practical instruction in the use of the compound microscope, and in the preparation of objects. For this, students are furnished with printed directions, and have individual instruction. During the five weeks following, the general morphology of plants, including vegetable anatomy and histology, is studied, there being about ten lectures, and thirty hours of laboratory work. Tests are made from time to time, by the use of disguised vegetable substances. Two weeks are taken for review, finishing drawings, and examination.

The special morphology of the great divisions of Cryptogamic and Phænogamic plants, their chief characteristics, their classifications, and the identification of species of Cryptogams, or flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied. During the term, there are about twenty lectures, and fifty-four hours of laboratory work, besides review and examination.

The most important books of reference in the English language are Sachs' Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cooke's Fungi, and Handbook of British Fungi.

Vegetable Physiology is studied the third term of the first year. The physiological part of Sachs' Botany is made the basis of this instruction, given by lectures with references to other publications, and with experimental practice. Respiration, assimilation, the circulation of fluids, the influence of light and temperature, growth and reproduction, are some of the topics treated, and sufficiently show the magnitude and importance of the study. Throughout the course, the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authority for the facts stated.

Anatomy and Physiology.—This study commences with

the first term of the second year. Anatomy is taught by lectures, aided by works of reference. The human skeleton and manikin are made the basis of comparison in the more extended Zoological researches. Physiology is taught by lectures, in which especial attention is given to the subjects of food, digestion, dress, circulation, respiration, ventilation, etc. The senses will be carefully studied, accompanied with suggestions for prolonging their greatest usefulness, that the controllable powers of the body may be preserved with their most efficient activities, to avoid preventable suffering and death, and to secure vigor and happiness.

Zoology continues two terms. In the first, Invertebrate Zoology is studied, unfolding the cardinal facts exemplified in the sub-kingdoms, Protozoa, Cœlenterata, Anuloida, Anulosa, and Mollusca, together with the general principles of respiration, circulation, special methods of reproduction and development; geographical and geological distribution; principles of natural classification, depending upon morphological types, and specialization of the functions, etc.

In the second, Vertebrate Zoology, embracing embryology, the modification of plan by which animals are adapted to the various conditions of existence, as manifest in their comparative anatomy, followed by Systematic Zoology, that the orders may be recognized at sight, etc. Nicholson's Manual of Zoology is used as a text-book.

Osteology and Taxidermy are taught in extra classes.

Osteology is taken up the winter term, to give the student a practical and theoretical knowledge of the vertebrate skeleton. It consists in laboratory work, alternating daily with a study of the comparative osteological collections in connection with recitations from Flower's Osteology as text. Attention is given to the cleaning and mounting of both ligamentary and articulated skeletons.

Taxidermy is commenced the spring term, and is designed to fit the student for the practical operations of collecting, preserving, and mounting objects of Natural History.

During the early part of the term attention is given to collecting and preparing skins of birds and mammals; the latter part of the term is occupied in mounting specimens from both fresh and dried skins.

Geology.—In Geology, Dana's Manual is used. In the first term instruction is given in Dynamical Geology, which explains the forces known to produce observed phenomena in the crust of

the earth; as life, in the formation of lime-stone, coal, peat; water, in eroding, transporting, and depositing material for strata; heat, as manifested in consolidation, metamorphism, and crystalization, as well as in mountain folds on the surface of a shrinking globe.

Lithological Geology is the next term's work. This treats of the kinds, nature, and material of rocks, stratified and unstratified; their mineral constituents; structure, original or induced; concretions, veins, dykes, etc.; methods of determining the chronological order of the strata. Also the historic development of the earth as revealed by

Paleontology, or the study of the entombed fossils of the Silurian aud Devonian ages. In the third term are discussed the Carboniferous age, with its coal; the reptilian and mammalian ages, with their wonderful inhabitants; the glacial period, with its continents of ice; the later changes reaching to the present time; and, in connection with these subjects, the elements of time, the system of life, the origin of species, the climax in man.

Physical Geography and Meteorology.—The principles of the phenomena manifest in the life of the earth bear the same relation to Geology that Physiology bears to Anatomy. This subject, a result of the facts of Geology, with an application of the laws of Physics, is taught by lectures and works of reference.

Entomology.—After some introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classification. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term three lectures per week are given upon insects, both injurious and beneficial, methods of exterminating, etc., and four hours per week are taken for laboratory work, naming species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study.

Students are required to provide themselves with collecting nets and bottles, pins, and lined boxes, and books for notes. Microscopes and other required apparatus are furnished by the University.

Microscopy and Fungology.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, preparation and mounting of material, etc. The application is mainly, but not exclusively, devoted to minute fungi, including those of the different fermentations and putrefactions. Such fungi as are known or supposed to be injurious to plants or animals are studied as carefully and thoroughly as circumstances permit, specimens being obtained by cultivation and from various other sources.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystallization is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western Plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of the fungi of the vicinity contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits by Dr. Auzoux, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has first-class microscopes of four different styles from European makers, one by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands were manufactured, from a new design, in the shops of the University.

In *Zoology*, the cabinets contain a human skeleton, and a manikin made by Dr. Auzoux; skeletons of the different orders of mammals, and of birds; stuffed preparations of a large number of birds, mammals, fishes, reptiles, etc.; a dissected eye, trachea and vocal apparatus, in *papier-mache*, by Dr. Auzoux; collections of shells, fossils, and insects.

The Geological Cabinet contains in addition to the specimens from the State Geological Survey, and other illustrative specimens, mineral and fossil, Prof. Ward's celebrated college series of casts of famous fossils, illustrating the various phases of life in geological history. This set of casts was the munificent gift of Emory Cobb, Esq., President of the Board of Trustees.

A valuable and extensive collection of the leads of the State and accompanying mineral, was presented by Gen. J. C. Smith, and other gentlemen, of Galena.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing, (optional): Trigonometry; French.
2. Chemistry: Free-Hand Drawing (optional); Analytical Geometry; French.
3. Vegetable Physiology; Chemistry, or Free-Hand Drawing; Rhetoric: French, (extra).

SECOND YEAR.

1. Anatomy and Physiology; Botany: German.
2. Zoology; Botany; German.
3. Zoology: Economic Entomology: German.

THIRD YEAR.

1. Geology: Mineralogy: German; Ancient History (optional, extra).
2. Geology: Physics: German: Mediæval History (optional, extra).
3. Geology: Physics: Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography; History of Civilization: Mental Science.
2. Microscopy and Fungology: Constitutional History; Logic.
3. Political Economy; Astronomy: Natural History Laboratory Work.

COLLEGE OF LITERATURE AND SCIENCE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean. | PROFESSOR SHATTUCK,
PROFESSOR PICKARD, | PROFESSOR CRAWFORD,

CHAS. E. PICKARD.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the school of Ancient Languages will be examined also in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody, (Harkness' or Allen and Greenough's); Latin prose composition, (Forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition

or parts one and two, to page 166, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted. The so-called Roman method of pronunciation of Latin is recommended, as found in Allen & Greenough's, or in the last edition of Harkness's Grammar.

GREEK.

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and diphthongs, and pronunciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors or publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate thsmselves as teachers, writers, and professors, in their special departments, require a knowledge of the ancient, as well as of the modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the arts. The large liberty allowed in the selection of the special studies of his course will permit the student to give such direction to his education as will fit him fully for any chosen sphere or pursuit.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, proof-reading, and other work intended to illustrate the studies pursued, and exercise the student's own powers. It is designed to give to all the students voice culture and a training in elocutionary practice.

A prominent aim will be to teach the right use of books, and thus prepare the student for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of practice in, English Composition, should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with the requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over twelve thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on page 22.)

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical language. This drill extends

through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read the entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times are investigated. Lectures are given from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German; to Philology; to the Philosophy of English literature, and to Esthetics. Essays, forensics, and orations are re uired.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease, scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage is gained by the student in linguistic culture. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year, the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition, and conversation.

Mathematics, Physics, and Astronomy.—For these studies, see School of Mechanical Engineering.

Natural Sciences.—See Schools of Chemistry and Natural History.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the third and fourth years of the University Course.

THIRD YEAR.

Ancient History of Greece and Rome, with notices of other nations: Ancient Geography: Mediæval History: Modern History: General European History: European Geography.

FOURTH YEAR.

Constitutional History of England and the United States: History of Civilization, Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers, and are therefore confined to the fourth year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of preception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful conditions of thought, growth and decay of mental and moral powers. Philosophy of Education. Theory of conscience: nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of argument, in the detection and answer of fallacies, and in the formation of habits of thinking, and the common judgments of life.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for Degree of B. L.

FIRST YEAR.

1. British Authors or Cicero de Amicitia; French: Trigonometry.
2. American Authors or Livy: French; Analytical Geometry.
3. Rhetoric: French; Calculus, or Free-Hand Drawing: Horace (optional, extra).

SECOND YEAR.

1. English Classics: German; Physiology, or Botany.
2. English Classics: German: Zoology, or Botany.
3. English Classics: German: Astronomy.

THIRD YEAR.

1. German; Chemistry: Ancient History.
2. German: Physics or Chemistry; Mediæval History.
3. German: Physics; Modern History.

FOURTH YEAR.

1. Anglo-Saxon: Mental Science: History of Civilization.
2. English Literature; Constitutional History; Logic.
3. Esthetics: Political Economy: Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitution of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As

an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year ancient history is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

For the studies in *History*, *Philosophy*, *etc.*, see School of English and Modern Languages.

For the studies in *Mathematics and Natural Science*, see Schools of Mechanical Engineering and Natural History.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Boise and Freeman's selections from Greek Authors and prose composition: Analytical Geometry.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Calculus.

SECOND YEAR.

1. Satires of Horace; Thucydides or German: Physiology.
2. Terence: Sophocles or German; Zoology.
3. Tacitus: Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French: Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. History of Civilization; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; English Literature; Logic.
3. Esthetics; Geology; Political Economy.

ADDITIONAL SCHOOLS.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR WM. T. WOOD,

2ND LIEUT. 18TH INFANTRY, U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the college classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc.
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties; Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is now under the charge of Lieut. Wm. T. Wood, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, and is in good standing in all his studies. The course of instruction is confined strictly to

two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other courses of study, to allow the members of other courses to enter this. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as captains in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after their first term, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms under careful leaders. Fee 50 cents.

The University Cornet Band is composed of students who while members of the band are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and at other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

3. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion: Skirmish Drill.
2. Ceremonies and Reviews: Military Signalling: Sword Fencing.
3. Guard, Outpost, and Picket Duty: Sword Fencing: Military Signalling.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire Arms; Target Practice; Artillery Drill.
2. Organization of Armies: Art of War: Field Fortification: Artillery Drill.

SCHOOL OF ART AND DESIGN.

Professor Peter Roos.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

Students not seeking a professional training may yet avail themselves of the two years' course in industrial art. Any person of ordinary ability who faithfully completes this course will be qualified to teach drawing and designing in public schools, or enter professions with great advantage in the various branches of industry, where artistic skill and taste are indispensible to success.

FIRST TERM.

(Exercises in Outline.)

Elements of Form; Analysis of Compound Forms; Elementary Designs; Elementary Perspective by aid of objects; Elements of Historic Ornaments: Memory Exercises.

SECOND TERM.

Enlargement and Shading from copy; Ornamental Designs from plant form; Naturalistic and Conventional Arrangement; Harmonious Lines and Distribution of Form; Perspective Drawing of Objects, Plants, etc.; Features of the Human Head; History of Early Art.

THIRD TERM.

Outline Drawing and Shading from Casts of Ornament; Application of Decorative Forms to flat and round surfaces under various conditions; Designs for specified objects: Advanced Perspective and Shadows; Harmony and Contrast of Color, (Lectures on Art, and its History).

FOURTH TERM.

(Clay and Wax Modelling.)

Basso Relievo Ornament from the Solid. Features and the Human Head from description; Relievo Ornament from shaded copies or drawings; Original Designs for decorative purposes; Enlargements and Reduction from casts; History of Styles of Ornament.

FIFTH TERM.

Shading from Statuary, Casts, etc.; Drawing of Landscape and Animals from copy in Charcoal and Sepia; Color applied to Decorative Art; Designs for useful Objects; Perspective drawings of interiors of Rooms.

SIXTH TERM.

General review of the principal work done; Specimen plates to be completed; Optical and Physical principles of Color in Nature; Aerial Perspective; Sketching from Nature in Charcoal and Color; Artistic Anatomy of Form and Proportion, by illustrated lectures; Famous Artists and their principal works.

Students having passed satisfactorily in the above course will be permitted to enter the advanced classes.

The following course is for those who wish to become accomplished either as designers, painters, or teachers. In order that the student may acquire thoroughness in the branch he wishes to pursue as a specialty, the subject has at this stage been formed into two divisions, decorative and pictorial. The teacher student must give attention to both branches, and with him theory will necessarily supersede practice. Opportunities will be afforded such pupils to teach in the elementary classes whereby greater efficiency will be acquired.

SPECIAL COURSE IN PAINTING.

Trees, Animals, and Figures from copy and from nature in Pencil, Charcoal, and Sepia; Aerial Perspective.

Anatomy of Expression; External muscular development; Shading from Statuary in Charcoal and Monochrome; Composition drawing from description; Memory Exercises.

Water Color Painting from pictures; Sketching from Nature in Sepia and Water Color; Copying from Oil Paintings of Portraits and Landscapes.

Sketching from Nature in Oil Colors; Rapid studies of interiors with varied arrangement of light and shade; Pictorial composition introducing figures or animals; Theory and History of Art.

Portrait Painting from life; Pictures finished from sketches; Studying of Groups of Still Life Subjects; Painting of ideal compositions of one or more heads; Chemistry of color.

ADVANCED COURSE IN DESIGNING.

Studies in Clay or Wax.

Ornaments and Plant form in Basso Relievo from flat examples; Designs adaptive to useful objects; The Human Figure from cast or original composition, reproduced by casting in metal or plaster; Processes of manufacture; Monumental designs.

Shading from cast and from nature; Classic objects and furniture enlarged from copy; Designs finished with Pen, Brush, and Distempera color; Architectural construction.

Design for Church Decoration in Historic Styles; Memorial Windows for stained glass; Decorative designs; Commemorating events in History; History of manufactures, and important inventions.

ADVANCED TEACHERS' COURSE.

A teacher must be prepared for emergencies for which the professional designer or artist has no experience. A general knowledge of the several subjects is therefore recommended. The decorative and painting courses will be worked together so as to form a thorough course for teachers.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvernay's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudes de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740, Books 1, 2, 3; Cramer's Studies, Books 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction for term of ten weeks—2 lessons a week	$10.00
For term of ten weeks—one lesson a week	6.00
Practice on piano, one hour daily, per term	2.00

MRS. JENNIE HOLLISTER,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents. The studies taught in the preliminary year are as follows:

PREPARATORY STUDIES.

For the Colleges of Engineering, Agriculture, and Natural Science.

First Term.—Algebra—(Olney's) Fundamental rules, Factoring, Common Divisors and Multiples, Powers and Roots, Calculus of Radicals, Simple Equations, Proportion and Progression. *Physiology*—(Dalton's or an equivalent.) *Natural Philosophy*—(Norton's or an equivalent.)

Second Term.—Algebra—Quadratic equations, etc. *Geometry*—Plane Geometry, Lines, Circumferences, Angles, Polygons, as far as equality in Olney's Geometry. *English*—Elements of Composition. (Gilmore's Art of expression or equivalent.) Orthoepy and Word Analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed including solid Geometry and the Sphere. *English* as in second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin*, Cæsar. *Greek*, Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin*, Cicero's Orations. *Greek*, Xenophon's Anabasis.

Third Term.—Geometry, completed. *Latin*, Virgil's Æneid. *Greek*, the Anabasis.

N. B.—Greek is required only for the School of Ancient languages. The School of English and modern languages requires Physiology, Natural Philosophy, or Botany instead of Greek.

Students in the preparatory studies are not matriculated as University students. They pay no entrance fee, but are charged a tuition fee of ten dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library and of the public lectures.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making the application, as to its facilities for teaching, its course and methods of instruction, and the general profi-

ciency shown. If the report is favorable, the name of the school is entered on the published list of High Schools, accredited by the University. The graduates of these schoools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	H. C. McDougall,	Principal.
Lake View High School	A. T. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	E. A. Gastman,	"
Salem High School	Loyd Crossett,	"
Champaign, East Side School	I. L. Betzer,	"
Urbana High School	J. W. Hayes,	"
Elmwood High School	J. M. Crow,	"
Oak Park High School	B. L. Dodge,	"
Chicago Central High School	Geo. Howland,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	H. H. Belfield,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park High School	Leslie Lewis, Supt.	
Marengo High School	C. J. Allen,	"
Blackstone High School	Wm. Jenkins,	"
Kankakee High School	C. W. Rolfe,	"
Mattoon E. Side High School	E. P. Rose,	"
Springfield High School	F. R. Feitshans,	"
Monticello High School	Gilbert A. Burgess,	"
Warren High School	D. E. Garver,	"
Maplewood High School	S. F. Hall,	"
Peru High School	Joseph Carter,	"
Peoria High School	Charles A. Smith,	"
Galena High School	S. Y. Gillan,	"
Shelbyville High School	C. L. Howard,	"
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	P. R. Walker,	"

EXAMINING SCHOOLS.

The Trustees have authorized the Faculty to designate one or more High Schools in each county of the State, of sufficiently high grade and good reputation, whose certificates of examination, in the branches required of candidates for the University, may be recieved in lieu of the usual examination of the University.

These must be Graded, or High Schools of good reputation, and of sufficiently extended course to prepare students for the University. The principal teachers of the schools selected will be authorized to prepare questions and conduct examinations of any of their students desirous of entering the University, but the papers must be sent to the University for final decision.

EXAMINING SCHOOLS.

Rockford West High School	W. W. Stetson,	Principal.
Buda High School	J. V. Wilkinson,	"
Sterling, 2d Ward High School	Alfred Bayliss,	"
S. Belvidere High School	J. W. Gibson,	"
Geneseo High School	B. F. Parge,	"
Belvidere High School	H. J. Sherrill,	"
Lanark High School	F. T. Oldt,	"
Gibson City High School	W. A. Wetzel,	"
Belleville High School	Henry Raab,	"
DeKalb High School	S. L. Graham,	"
Dwight High School	Jesse Hubbard,	"
Macomb High School	J. F. Gowdy,	"
Kinmundy High School	N. S. Scovell,	"
Rantoul High School	N. J. Betzer,	"
Bement High School	T, C. Clendenin,	"

MISCELLANY.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies, without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as President of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses

of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelors' Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

7. The Degree of Bachelor of letters, B. L., will be given to those who complete the course in the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course of the School of Ancient Languages.

S. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued, and passed examinations on, a year of prescribed post-graduate studies, or after a term of successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding houses in Urbana or Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2.00

per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses see page 83.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible, to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill, secure more pay.

Some students, who have the requisite *skill*, *industry*, *and economy*, pay their entire expenses by their labor; but, in general, young men connot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

STUDENTS' GOVERNMENT.

For several years an experiment has been in progress, in the self-government of the students of the University. By permission of the Faculty, the General Assembly of the students was organized, and a constitution adopted providing for the election of a President, Vice-President, Secretary, and Marshal; for a Senate of twenty-one members, and a court consisting of a Chief Justice and two Associate Judges. Under this constitution, laws are enacted by the Senate, which become valid only when approved by the Regent and Faculty of the University. All offenses against these laws are tried before the student's court, and punished by fines according to the class of the offense. Students refusing to pay the fines imposed by the students' government are referred to the Faculty, and if found guilty of an offense, are sentenced to such penalties as the Faculty may deem proper. The government has thus far rendered important aid in maintaining good order in

the dormitories and grounds, in preserving public property, in preventing the visiting of saloons, and in other matters requiring the intervention of authority, and above all, in cultivating kindly relations between the Students and Faculty and a spirit of manliness and self control.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what will be required to know and do in order to gain admission. To such these words are addressed:

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of the common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 26 and 76.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College. (See page 76.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten, the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount........$10.00

THE TERM FEE for Incidental Expenses is, for each student 7.50

Room Rent in University Dormitory, each student per term..................................$2.00 to 6.00

Each student in the Chemical and Physical Labratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $8, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are the estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University.

	MIN.	MAX.
Term Fees and Room Rent for each Student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing, at 75 cents per dozen	13.50	27.00
Total Annual Amount	$123.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$10.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students	10.00
Graduating Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money*, without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under 20 years of age.

CALENDAR FOR 1881-82.

Examinations for Admission	Monday, September 12
First or Fall Term begins	Wednesday, September 14
Closing of the First Term	Wednesday, December 21

WINTER VACATION.

FOR 1882.

Examination for Admission to Advanced Classes	Tuesday, January 3
Opening of the Second or Winter Term	Wednesday, January 4
Anniversary Day	March 11
Second Term Closes	Wednesday, March 21
Third or Spring Term begins	Wednesday, March 21
Baccalaureate Address in University Chapel	Sunday, June 4
Class Day	Monday, June 5
Society Addresses	Tuesday, June 6
Commencement	Wednesday, June 7

SUMMER VACATION.

Examinations for Admission	Monday, September 11
First or Fall Term begins	Wednesday, September 13

LEARNING AND LABOR.

CATALOGUE AND CIRCULAR

OF THE

Illinois Industrial University,

URBANA, CHAMPAIGN COUNTY, ILL.

1881-82

CHAMPAIGN:
Gazette Steam Print.

1882.


STATE SOVEREIGNTY.
NATIONAL UNION

BOARD OF TRUSTEES.

FACULTY.

SELIM H. PEABODY, Ph. D., LL. D.,
Regent, and Professor of Mechanical Engineering and Physics.

THOMAS J. BURRILL, M. A., Ph. D.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

DON CARLOS TAFT, M. A.,
Professor of Geology and Zoology.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

HENRY A. WEBER, Ph. D.,
Professor of Chemistry.

GEORGE E. MORROW, LL. B.,
Professor of Agriculture.

OFFICERS AND INSTRUCTORS.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

PETER ROOS,
Professor of Industrial Art and Designing.

WILLIAM T. WOOD,
SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

MELVILLE A. SCOVELL, M. S.,
Professor of Agricultural Chemistry.

CECIL H. PEABODY, B. S.,
Assistant Professor of Mechanical Engineering

CHARLES E. PICKARD, B. A.,
Assistant in English and Ancient Languages.

EDWIN A. KIMBALL,
Foreman of Machine Shop.

NELSON S. SPENCER,
Foreman of Carpenter Shop.

JEROME SONDERICKER, B. S.,
Instructor in Right Line Drawing.

J. C. FEITSHANS, M. A.,
Instructor in Elocution.

CHARLES J. ROLFE, M. S.,
Instructor of Mathematics and Botany.

OFFICERS AND INSTRUCTORS.

JAMES E. ARMSTRONG, B. S.,
Instructor in Natural Science, and Taxidermist.

MRS. ABBIE WILKINSON,
Teacher of Vocal and Instrumental Music.

CHARLES C. BARNES,
First Assistant in Chemical Laboratory.

HOWARD SLAUSON,
Second Assistant in Chemical Laboratory.

LIST OF STUDENTS.

RESIDENT GRADUATES.

NAME.	RESIDENCE.
Armstrong, James E, B. S.	Seneca.
Forsyth, James	Springfield.
Hays, Charles I, B. S.	Champaign.
Hill, Fred L	Paxton.
Hill, T Crawford, B. A.	Tolono.
Robinson, Albert F, B. S.	Jacksonville.
Seymour, Arthur B, B. S.	Camp Point.
Sondericker, Jerome, B. S.	Woodstock.
Weston, William S, B. L.	Champaign.

SENIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bailey, Samuel G jr	Chemistry and Military	Chicago.
Barnes, Charles C	Chemistry	Champaign.
Bridge, Arthur M	Lit. and Science and Mil.	La Moille.
Bullard, Benjamin F	Literature and Science	Mechanicsburg.
Bullard, George W	Architecture.	Mechanicsburg.
Carman, William B	Chemistry and Military	Urbana.
*Cole, Edward E	Lit. and Science and Mil.	Champaign.
Curtis, William G	Agriculture.	Warren.
Davis, Jeptha H	Literature and Science	Monticello.
*Eaton, William T	Civil Engineering.	Warrensburg.
Eichberg, David	Lit. and Science and Mil.	Atlanta.
Eisenmayer, A J	Mech. Eng. and Military	Trenton.
Harrison, Samuel A	Lit. and Science and Mil.	Upper Alton.
Merritt, Charles H	Natural History	Waterman.
Neely, John R	Lit. and Science and Mil.	Du Quoin.
Noble, Thomas	Civil Engineering.	Todd's Point.
Orr, Robert E	Civ. Engineering and Mil.	Champaign.

NAME.	COURSE	RESIDENCE.
Palmer, Charles W	Literature and Science.	Watseka.
Peabody, Arthur	Architecture.	Champaign.
Richards, George W	Civ. Eng. and Military.	Quincy.
Roberts, Charles N	Mech. Engineering.	Jefferson.
Rugg, Fred D	Literature and Science.	Champaign.
Sharp, Abia J	Mech. Eng. and Military.	East Lynne, Mo.
Shlaudeman, Frank	Mech. Engineering.	Decatur.
Slauson, Howard	Chemistry.	Bloomington.
Smith, Charles L	Lit. and Science and Mil.	Champaign.
Spencer, Nelson S	Architecture.	Champaign.
Taft, Florizel A	Natural History.	Champaign.
Todd, James	Mech. Engineering.	Elgin.
Turner, Herbert	Agriculture and Military	Quincy.
Wadsworth, John G	Lit. and Science and Mil.	Madison, Dakota.

LADIES..

NAME.	COURSE.	RESIDENCE.
Andrus, Dora A	Literature and Science.	Ashton.
Avery, Kitty C	Literature and Science.	Champaign.
*Cole, Fronia R	Literature and Science	Champaign.
*Raley, Arvilla K	Literature and Science.	Granville.

JUNIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Edward L	Civil Engineering	Union Grove
*Bacon, Theodore H	Civil Engineering	Champaign
Bogardus, C Eugene	Chemistry	Champaign
Bogardus, Edward F	Elective	Champaign
*Brainard, Clarence	Civil Engineering	Buda
Chapman, Norman W	Civil Engineering	Gerlaw
Craig, William P	Literature and Science	Champaign
Diffenbaugh, Harry	Chemistry	Dwight
*Donovan, Jno L. jr	Literature and Science	Watseka
*Durfee, Elisha B	Literature and Science	Marion, Ohio
French, George H	Civil Engineering	Milton
Gates, Alphonso S	Civil Engineering	Hamilton

NAME.	COURSE.	RESIDENCE.
Goltra, William F	Civ Eng and Military	Bourbonnais' Gr
Gray, Nelson A	Lit and Science and Mil	Champaign
Haven, Dwight C	Lit and Science and Mil	New Lenox
Heath, William A	Literature and Science	Champaign
Hewes, George C	Chemistry	Farmer City
Hudgens, C Dana	Mech Eng and Military	Sandwich
Kenower, John T	Chemistry	Clement
Lewis, Ralph D	Literature and Science	Utica
*Little, Henry P	Chemistry	Urbana
McCune, Henry L	Lit and Science and Mil	Ipava
Maltby, Frank B	Mechanical Engineering	Champaign
Moore, William D	Mechanical Engineering	Chatham
Palmer, Arthur W	Chemistry	Springfield
*Piatt, Silas H	Agriculture	Monticello
*Pierce, Frederic D	Chemistry and Military	Polo
*Postel, Julius	Literature and Science	Mascoutah
Scotchbrook, Geo P	Civil Engineering	Morrison
*Sondericker, Wm	Literature and Science	Woodstock
Tinkham, M D C	Chemistry	Homer
Warrington, James N	Mechanical Engineering	Chicago
Weis, Joseph	Chemistry	Tonica

LADIES.

NAME.	COURSE.	RESIDENCE.
Ashby, Lida	Literature and Science	Champaign
Boggs, Hattie M	Literature and Science	Tuscola
Colvin, Mary S	Literature and Science	Mt Palatine
*Conkling, Anna J	Literature and Science	Champaign
Fellows, Clara B	Literature and Science	Farmer City
Gardner, Jessie	Literature and Science	Champaign
*Hall, Lucy A	Literature and Science	Champaign
Healey, Grace	Literature and Science	Champaign
Knowlton, Lizzie A	Literature and Science	Urbana
Langley, M Celeste	Literature and Science	Champaign
Lewis, C Florence	Literature and Science	Farmer City
Peabody, Kate F	Literature and Science	Champaign
*Smith, Laura B	Literature and Science	Champaign
*Stewart, Ella M	Literature and Science	Champaign
*Victor, Mary	Literature and Science	Champaign
*Wright, Minnie E	Literature and Science	Champaign

SOPHOMORE CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, William L	Mechanical Engineering	Union Grove
*Aherin, Thomas	Chemistry	Girard
*Allen, E Wright	Agriculture	Harristown
Alling, Charles A	Civil Engineering and Mil	Champaign
*Austin, James	Civil Engineering	Altona
*Ayres, Judson F	Chemistry	Urbana
Babcock, Guy H	Agriculture and Military	Ridott
*Bacon, George H	Literature and Science	Champaign
*Barber, Henry H	Civil Engineering and Mil	Savanna
*Bartlett, Benj A W	Architecture	Des Moines, Iowa
*Barmm, Charles E	Mechanical Engineering	Chicago
Bartholf, Emmett G	Literature and Science	Plainfield
*Boller, Chester E	Architecture	Lexington
Braucher, Arthur C	Civil Engineering	Lincoln
*Braucher, Wm B	Mechanical Engineering	Lincoln
*Brinkman, Edward	Chemistry	Edwardsville
Burt, Angelo R	Mechanical Engineering	Dubuque, Iowa
*Carman, John C	Literature and Science	Urbana
*Carse, David B	Chemistry	Chicago
*Cole, T. Edward	Elective	Champaign
*Crandall, Frederic A	Literature and Science	Loda
*Dougherty, M L	Literature and Science	Mason City
*Dunlap, Robert L	Chemistry	Savoy
*Eberlein, Fred W	Chemistry	Champaign
Eliel, Albert L	Mechanical Engineering	La Salle
Going, Judson F	Lit and Science and Mil	Warren
Haas, Solomon I	Architecture	Savanna
Herdman, Frank E	Mech Engineering and Mil	Zanesville, Ohio
*Hermann, David	Civil Engineering	Highland
Hunt, Thomas F	Agriculture	Ridott
*Kamman, Charles H	Elective and Military	Mascoutah
Kimball, Edwin R	Chemistry and Military	Champaign
*Lietze, Frederic A	Civil Engineering	Carlyle
Lilly, Charles H	Chemistry and Military	Champaign
*Lilly, James E	Ancient Languages	Champaign
*McCoy, Joseph S	Literature and Science	French Grove
*McClure, George W	Agriculture	Farina
*McEathron, Wm J	Civil Engineering	Lena

NAME.	COURSE.	RESIDENCE.
*Marshall, John H	Ancient Languages	Decatur
Meriwether, Edward	Agriculture	Shipman
*Moffett, John B	Literature and Science	Decatur
Montezuma, Charles	Chemistry	Urbana
*Morgan, George N	Literature and Science	Kinmundy
*Morse, E Leland	Lit and Science and Mil	Cazenovia
*Norman, Charles C	Elective	Carlyle
*North, Arthur T	Architecture	Kewanee
*Odell, Arthur M	Civil Engineering	East Dubuque
*Parr, Samuel W	Mechanical Engineering	Gibson City
Peart, George K	Civil Engineering	Braidwood
*Philbrick, Solon	Literature and Science	Baileyville
*Randolph, T F	Chemistry	Canton
*Reynolds, Henry L	Mechanical Engineering	Camp Point
Roberts, Lewis C	Elective and Military	Jefferson
Shurtleff, Charles W	Elective	Genoa
*Sim, Benjamin F	Mining Engineering	Urbana
Sizer, Lucius N	Lit and Science and Mil	Mahomet
*Smead, William H	Lit and Science and Mil	Rockford
*Smith, Tracy A	Elective	Wilmington
*Speidel, Ernst	Chemistry	Rock Island
*Spencer, Howard M	Mechanical Engineering	Dixon
*Stannard, Albert C	Chemistry and Military	Champaign
Stevens, Hubert A	Civil Engineering	Chicago
*Stewart, Walter N	Agriculture	Champaign
*Stratton, Samuel W	Mech Engineering and Mil	Litchfield
Van Petten, H S	Chemistry	Chillicothe
Vial, Edmund R	Agriculture	Western Springs
*Vial, Frederic K	Agriculture	Western Springs
*West, Charles H	Civ Engineering and Mil	Greenville Miss
Whittemore, Benj M	Lit and Science and Mil	Charleston
*Wills, Jerome G	Literature and Science	Sailor Springs
Wilmot, Frank L	Chemistry	Lawn Ridge
*Womacks, Wilson E	Literature and Science	Champaign

LADIES.

NAME.	COURSE.	RESIDENCE.
*Ayres, Nettie	Literature and Science	Urbana
*Barber, Ella U	Literature and Science	Champaign
Braucher, Alma E	Natural History	Lincoln
Carman, Nellie M	Literature and Science	Urbana

NAME.	COURSE.	RESIDENCE.
Clark, Lucy J	Natural History	Champaign
*Ellis, Lola D	Literature and Science	Canton
*Everett, M Kate	Literature and Science	Champaign
*Fuller, Ruth W	Literature and Science	Montague, Mass
*Hall, Nira May	Literature and Science	Metamora
*Hill, Cora J	Natural History	Paxton
Kemball, Georgetta	Literature and Science	Champaign
*Krause, Josephine	Literature and Science	Chicago
*Lewis, Georgetta L	Literature and Science	Champaign
Morris, Ida M	Literature and Science	Pesotum
*Reed, E May	Literature and Science	Frankfort, Kan
Ross, Della	Literature and Science	Avon
*Scoggin, M Alice	Literature and Science	Champaign
Sim, Keturah E	Literature and Science	Urbana
Somers, Cora	Literature and Science	Urbana

FRESHMAN CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
*Adams, A Grant	Chemistry	Tolono
Baker, E Jerome	Lit and Science and Mil	Chicago
Bargh, Edwin C	Literature and Science	Kinmundy
Basset, Owen B	Agriculture and Mil	Dana
*Baxter, Thomas L	Mechanical Engineering	Chicago
Boring, William A	Architecture	Chicago
*Braucher, Edward R	Mechanical Engineering	Lincoln
Carter, Harry L	Mechanical Engineering	Humboldt
Clark, William B	Chemistry	Worthington, Pa
Cole, Bert W	Literature and Science	Champaign
Colton, Samuel K	Architecture	Chicago
Colton, Simeon C	Civil Engineering	Chicago
*Connor, John	Literature and Science	Sidney
Cook, Curtin	Chemistry	Tolono
*Corwin, Cecil S	Architecture	Racine, Wis
*Cummings, H B	Chemistry	Buda
Doering, Chase	Literature and Science	Central City
*Earle, Charles T	Chemistry	Cobden
Ellis, George H	Chemistry	Milwaukee, Wis
Endsley, Willis	Literature and Science	Milford
Greeley, George H	Mechanical Engineering	Waterman
Gregory, Grant	Literature and Science	Champaign

NAME.	COURSE.	RESIDENCE.
Hicks, George L	Literature and Science	Warren
*Hopper, Charles S	Literature and Science	Bristol
*Holmes, Thomas J	Chemistry	Aledo
Huber, Otto	Literature and Science	Rock Island
Ivey, John J	Mechanical Engineering	Little York
Kendall, William F	Civil Engineering	Rock Island
Kent, James M	Mechanical Engineering	Kewanee
Kilborn, Orrel L	Civil Engineering	Marshall
Krause, Frederic F	Mining Engineering	Chicago
Lantz, Milo P	Elective and Military	Oak Grove
Lattin, Judson	Mech Engineering and Mil	Sycamore
*McCoy, John	Mechanical Engineering	Little York
McGlashen D S	Natural History	Frankfort
Marshall, Sherman L	Lit and Science and Mil	Ipava
Mathers, George B	Civil Engineering	Mason City
Meriwether, A P	Agriculture	Shipman
*Miller, Harry R	Literature and Science	Champaign
Miller, William B	Mech Engineering and Mil	Hyde Park
Moffett, William D	Civil Engineering	Decatur
More, George F	Mech Engineering and Mil	Polo
*O'Ferrall, Robert L	Literature and Science	Pilot
Pearman, Ira E	Literature and Science	Champaign
Peterson, Harry G	Elective	Champaign
Petty, George R	Mechanical Engineering	Pittsfield
*Piatt, Jacob	Civil Engineering	Monticello
Piety, Myron M	Literature and Science	Urbana
*Rankin, Charles H	Civil Engineering	Fall Creek
Roberts, Vurtus B	Civil Engineering and Mil	Plainfield
Ronalds, Hugh L	Mechanical Engineering	Grayville
Schaub, Edward L T	Civil Engineering and Mil	Columbus, O
*Schleder, Theo H	Civil Engineering	Green Vale
Schrader, Alfred C	Civil Engineering	New Lenox
*Scott, John K	Elective	Champaign
Sherrill, Frank A	Civil Engineering	Belvidere
Stockham, Wm H	Mech Engineering and Mil	Chicago
Stuart, Frank	Literature and Science	Sidney
Swern, William C	Architecture	Marshall
Taggart, James S	Agriculture	Ridott
Taylor, John F	Civil Engineering	Taylor
Woodworth, Chas W	Chemistry	Champaign
Wright, John E	Literature and Science	Champaign

LADIES.

NAME.	COURSE.	RESIDENCE.
Avery, Minnehaha	Elective	Champaign
Clark, Clara A	Natural History	Marseilles
Clark, Kate F	Natural History.	Cobden
†Coller, Minnie I	Literature and Science	Urbana
*Cumberland, Hattie	Literature and Science	Champaign
Earle, Mary T	Natural History	Cobden
Jones, Emma T	Literature and Science	Champaign
Little, Cora G	Elective	Urbana
McNary, Margaret E	Literature and Science	Pana
Maltby, Cora	Literature and Science	Champaign
Moore, Mae C	Elective	Champaign
Owens, Bessie W	Literature and Science	Urbana
Parrill, Lizzie	Elective	Farina
*Plank, Bessie G	Literature and Science	Champaign
Switzer, Lottie	Literature and Science	Champaign
Thomas, Fannie	Literature and Science	Kickapoo
Way, Ada B	Literature and Science	Champaign
Weeks, Eliza J	Literature and Science	Urbana
Weston, Abbie	Literature and Science	Champaign
*Wills, Etta G	Literature and Science	Sailor Springs
*Wilson, Rachel S	Literature and Science	Paris
*Wright, Kate G	Literature and Science	Champaign
Wright, Lizzie M	Literature and Science	Champaign
Wright, Minnie S	Literature and Science	Plainfield

PREPARATORY CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Babcock, William A	Literature and Science	Ipava
Bacon, Charles E	Literature and Science.	Ipava
Blakeslee, C E	Mechanical Engineering	Du Quoin
Bliss, George W.	Agriculture	Nokomis
Boothby, George W	Chemistry	Champaign
Boyd, Henry I	Civil Engineering	Sheffield
Brown, Simon		Grant Fork
Bullard, S Foster		Mechanicsburg
Burt, Frank A	Mechanical Engineering	Dubuque, Iowa
Coleman, John A		Bloomington
Constant, James H	Architecture	Damson

†Died Nov. 16, 1881.

NAME.	COURSE.	RESIDENCE.
Davis, James O		French Grove
Dewey, Ralph E		Penfield
Dillin, Robert B		De Land
Fulton, James		Eureka
Grubb, Edwin S	Literature and Science	Springfield
Hamilton, Charles F		Champaign
Hillis, George S	Chemistry	Hillsboro
Holden, Nathan E		Danville
Hull, Lucius M	Literature and Science	Godfrey
Johnston, William	Chemistry	Carlyle
Jones, Carroll C	Agriculture	Tuscola
Jones, John W	Mechanical Engineering	Bodega, Cal
Kemman, Alveno F	Mechanical Engineering	La Grange
Kutnewsky, Chas. F		Groveland
Latham, Ector B	Mining Engineering	Atlanta, Ga
*Lawrence, Philip E	Literature and Science	Galesburg
Linn, James A		Liberty
Lumley, Clinton G	Literature and Science	Ringwood
McBarnes, Ed. E		Bloomington
McBride, George W		Girard
McCune, Myron Q	Literature and Science	Ipava
McGregor, Wm. G	Mechanical Engineering	Chicago
Mack, Rosco D	Mechanical Engineering	Paris
Manns, Albert G	Chemistry	Chicago
Marquiss, John A	Literature and Science	Monticello
Milliken, Thomas A		Dudley
Milnes, George S	Chemistry	Morrison
Noble, John		Todd's Point
O'Neal, Robert	Architecture	Carrollton, Ky
Parker, William H	Literature and Science	Oswego
Paxton, Charles M	Agriculture	Kansas
Petty, Thomas J		Pittsfield
Philbrick, Alvah	Civil Engineering	Baileyville
Plank, Delmar E	Civil Engineering	Peoria
Porterfield, L Wilson		Sidney
Richards, Albert L	Mechanical Engineering	Burton
Roberts, Adrian L	Civil Engineering	Canton
Roberts, Charles J		Champaign
Robison, Elmer C		Tremont
Rupp, Andrew O	Literature and Science	Chenoa
Russell, Charles M		Urbana

NAME.	COURSE.	RESIDENCE.
Sickles, F Henry	Natural History	Champaign
Squire, Willis C	Mechanical Engineering	La Grange
Thompson, John	Civil Engineering	Mechanicsburg
Watson, Ralph W	Architecture.	Calumet
Whitmire, Z Lincoln	Natural History	Metamora
Wilder, Henry W	Ancient Languages	Champaign.
Williams, James A	Literature and Science	Putnam
Woodward, Edw M	Literature and Science	Odin

LADIES.

NAME.	COURSE.	RESIDENCE.
Bozarth, Phebe L		Cotton Hill
Dewey, Helena		Penfield
Gillespie, Estelle		Tuscola
Latham, Nita D	Literature and Science	Atlanta, Ga
Merboth, Louisa		Spring Bay
Moss, Lucretia O		Champaign.
Reese, Mary	Literature and Science	Sidney
Sharp, Emma G	Natural History	East Lynne, Mo.
Watkins, Alice F	Natural History	Cobden
Yaple, Maud L	Natural History	Mendon, Mich
Zeller, Josephine M		Spring Bay

SPECIAL STUDENTS.

NAME.	RESIDENCE.
AGRICULTURE.	
Henson, Milton M	Camargo
Lee, Scovill	Millersburg
North, William F	Winchester
Sloper, A. Frederick	Long Lake
ART AND DESIGN.	
Adams, C. F	Champaign
Allen, Aleck M	Champaign
Chase, Morton E	Champaign
Page, Hannah M	Champaign
CHEMISTRY.	
Hill, Julia T	Nevada, Mo
Newport, Charles L	Champaign

SUMMARY.

BY CLASSES.	GENTLEMEN.	LADIES.	TOTAL.
Resident Graduates	9	0	9
Seniors	31	4	35
Juniors	33	16	49
Sophomores	72	19	91
Freshmen	63	24	87
Preparatory	60	11	71
Special	8	2	10
Total	276	76	352
BY COURSES.			
Agriculture	21		21
Mechanical Engineering	41		41
Civil Engineering	41		41
Mining Engineering	3		3
Architecture	14		14
Chemistry	41	1	42
Natural History	5	9	14
Art and Design	3	1	4
English and Modern Languages	65	54	119
Ancient Languages	4		4
Elective	10	4	14
Not Specified	19	7	26
	267	76	343
Resident Graduates	9		9
Total	276	76	352

Illinois Industrial University.

HISTORY.

THE Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main Building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, till four Colleges, including ten distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1698. The number graduated from the several Colleges, including the class of 1881, is 302. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1878 its exhibit at the Paris International Exposition gained the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The county is a

region of beautiful rolling prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building for public use, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler, forge and tank room; a Machine Shop, furnished for practical use, with a steam engine, lathes, and other machinery; pattern and finishing shops, shops for carpentry and cabinet work, furnished with wood-working machinery; paint and draughting-rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also well supplied with gymnastic apparatus. One of the towers contains an armorer's shop and military model room, an artillery room and a band room. The other contains a printing office and editor's room.

The Chemical Building, erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 25,000 acres of well selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and county bonds amounting to $319,000, besides other property and avails, valued at $33,000. The State has appropriated $25,000 to the Agricultural Department for barns, tools, stock, etc.; $25,000 to the Horticultural Department for green-houses, barns, drainage, tools, trees, etc.; $25,000 for Mechanical and Military Building, machinery, etc.; $127,000 toward the erection of the Main Building. and furnishing the same; $10,500 for Chemical Apparatus; $25,000 for Library; $5,000 for the Apparatus of a Physical Laboratory; $3,000 for a Veterinary Hall, Stable, and Apparatus;

$40,000 for a Chemical Building; besides smaller amounts for agricultural experiments, etc.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich and equalled at few, if any, of the colleges of the west. Among these collections are included the following:

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles, and mammals, from the oldest paleozoic time to the present. Also a fine set of fossils obtained from Germany, besides collections of fossils of this and other States, well illustrating the different formations, and suitably arranged for practical study.

Conchology.—A large collection of shells fully illustrating the principles of conchology as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals, with the single exception of the order of proboscidea; also typical representatives of the amphibious reptiles and of fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivors and fur bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders, and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of the grasses and sedges. There are besides many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc.

A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees

and shrubs of Stephenson County, Illinois, are represented by a distinct collection.

Plaster casts of fruits represent many of the leading varieties, as well as interesting specimens, showing peculiarities of growth, effects of cross fertilization. etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized; these, with a complete set of imported models, fully illustrate crystallography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, drill presses, and the requisite hand tools, benches, vices, anvils, etc., for pattern shop, blacksmith shop, moulding room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work shops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, illustrating sections of mines, machinery for elevating and breaking ores, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture, it embraces thirteen full size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 12,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study encouraged or required. The reading-room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received:

AGRICULTURAL AND HORTICULTURAL.

Prarie Farmer.
Western Rural.
Country Gentleman.
Breeder's Gazette.
Indiana Farmer.
New England Farmer.
Michigan Farmer.
Farmer and Fruit Grower.
Iowa Homestead.
Agricultural Gazette, *London*.
Gardner's Chronicle, *London*.
Journal d'Agriculture Pratique, *Paris*.
Revue Horticole, *Paris*.
American Agriculturist.
Western Agriculturist.
Live Stock Journal.
Horticulturist.
Farmer's Review.
Veterinary Journal.
Recueil de Medicine Veterinarie, *Paris*.

ENGINEERING.

Encyclopedie d'Architecture, *Paris*.
Engineering, *London*.
Building News, *London*.
Builder, *London*.
Skizzen-buch, *Berlin*
Transactions American Society of Civil Engineers.
Scientific American.
Engineering News
Engineering and Mining Journal.
Scientific American Supplement.

Sanitary Engineer.
Van Nostrand's Engineering Magazine.
The Workshop.
American Architect.
American Machinest.
Western Manufacturer.
Gazette of Patent Office.

SCIENTIFIC.

Annales des Sciences Naturelles, *Paris.*
Nature, *London.*
Grevillea, *London.*
Comptes Rendus, *Paris.*
La Lumiere Electrique, *Paris.*
American Journal of Pharmacy.
The Druggist.
Chemical News, *London.*
American Journal of Chemistry.
Polytechnisches Journal, *Augsburg.*
Jahrbericht der Chemie, *Giessen.*
Annalen der Chemie, *Leipsic.*
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
Journal of Franklin Institute.
Journal Mathematiques.
Mathematical Quarterly.
Mathematisches Journal.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review.
Contemporary Review.
Fortnightly Review.
North American Review.
Atlantic Monthly.
Scribner's Monthly.
Library Journal.
Literary World.
American Journal of Education.
Education.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Princeton Review.
Stoddard's Review.
United Service Magazine.
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Paxton Record.
Musical Record.
Signal.

The exchanges of the *Illini* are also free to the students in the Library.

4

AIMS OF THE UNIVERSITY.

The University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships, as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges, which are subdivided into Schools. A School is understood to embrace the course of

instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.

School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.

School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, Elocution, and Photography are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

It has been a favorite aim of the University from the outset, to allow as much freedom as possible in the selection of studies.

A University is designed not for children, but for men and women, who may claim to know something of their wants, powers, and tastes. It is not useful to require every student, without regard to his capacity or practical wants, to take entire some lengthened "course of study." Each student should weigh carefully his own powers and needs, and counsel freely with his teachers as to the branches he may need to fit him for his chosen career, and then should pursue them with earnestness and perseverance, without faltering or fickleness.

It is necessarily required:—that the student shall be thoroughly prepared to enter and keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies can be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term. one study at least from the following list:

Physics, Chemistry, Mineralogy, Physical Geography, Anatomy and and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and Designing, Elements of Construction, Graphical Statics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Aanlytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, the day previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and

Composition. These are required in addition to 1 and 2 for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy, Latin Grammar and Reader. Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, in addition to 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also "*Preliminary Year.*"

COUNTY SUPERINTENDENT'S CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches, Arithmetic, Geography, English Grammar, and History of the United States; those who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

COLLEGE OF AGRICULTURE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean,
PROFESSOR BURRILL,
PROFESSOR PRENTICE,
PROFESSOR SCOVELL.

CHARLES W. ROLFE.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that

man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming—of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm; its improvement by mechanical means, as drainage and irrigation; its Divisions, Fences, Hedges, etc.; its Water Supply; the construction of Roads; arrangement, planning and construction of Farm Buildings; the construction, selection, care, and use of Farm Implements and Machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops —cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural Literature and Organizations.

Rural Law.—Business law; Laws especially effecting Agriculture—tenures of Real Estate; Road, Fence, Drainage laws, etc.

HORTICULTURE.

Elements of Horticulture —The following topics are discussed: Orchard sites, the Age of Trees to Plant, the Season to Plant, How to Plant, What to Plant, the Management of the Soil, Pruning and Care of Trees, Gathering and Preserving Fruit, Diseases and Injuries, the Nursery, Ornamental Trees and Shrubs, Flower Gardens, Vegetable Gardens including Propagating Beds and Houses, the Vineyard and Small Fruits, and Timber Tree Plantations. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the College. Excursions are made when found practicable for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for specially horticultural pursuits and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Plant Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the Domestic Animals is taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are also given on

Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the agricultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines, their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and Special Investigations by each student. A Thesis is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorology, see statements in College of Natural Science.

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, and several breeds of swine, to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture under the direction of the Professors of Agriculture and of Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The Barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The Barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large windmill, which furnishes power for grinding feed, and for other purposes.

A Veterinary Hall and Stable has been provided, and a Clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and teeth of the horse at different ages.

Surveying and Drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College, there are: 1. A very large specimen apple orchard planted in 1869, and containing above 1,000 varieties,—many varieties of pears, cherries, grapes, and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An aboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different material and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house, contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements ot Agriculture ; Chemistry ; Trigonometry ; Shop Practice (optional).
2. Elements of Horticulture ; Chemistry ; British Authors, or Free Hand Drawing.
3. Vegetable Physiology ; Chemistry ; Rhetoric.

SECOND YEAR.

1. Agricultural Chemistry (Soils and Plants) ; Botany ; German.
2. Agricultural Chemistry (Tillage, Fertilizers, Foods) ; Botany ; German.
3. Economic Entomology ; Zoology ; German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Geology or Ancient History.
2. Animal Husbandry; Veterinary Science; Physics or Mediæval History.
3. Landscape Gardening; Veterinary Science; Physics or Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 32 and 33.

FARMER'S COURSE.

Students who cannot give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veter inary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology ; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Practical Entomology or Landscape Gardening.

COLLEGE OF ENGINEERING.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean,
PROFESSOR SHATTUCK,
E. A. KIMBALL,
PROFESSOR BAKER,
PROFESSOR ROOS,
J. SONDERICKER,
PROFESSOR C. H. PEABODY.

SCHOOLS.

MECHANICAL ENGINEERING, ARCHITECTURE,

CIVIL AND MINING ENGINEERING.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

French or German are pursued two years each. Some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text-book, and the drawings made on smooth paper, eight by ten inches.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises:

For manuscripts and unimportant drawings, a heavy flat-cap paper.

For ordinary drawings, not colored, a heavy, first quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings, and lettering, the best three-ply Bristol board. For problems, exercises, lecture notes, theses, and other manuscripts, and for geometrical projection, topographical, railroad, typographical, and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used it must be cut 8x10 inches, and the binding margin hinged on with muslin.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labeled with the donors' names, and placed in the cabinets of the College for the inspection of students and the illustration of lectures.

THESES.

In all the schools of this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink, or colors. It must be upon regulation paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the library of the University.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at clear understanding and mastery of all mechanical principles and devices. Practice in the mechanical Laboratory, is counted as one of the studies of the course.

In PRINCIPLES instruction is imparted by lectures, illustrated plates, and by text books. Examples are given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In PRACTICE elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In DESIGNING the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents four different shops, viz.:

1—PATTERN MAKING.

2—BLACKSMITHING.

3—BENCH WORK FOR IRON.

4—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces of various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made, from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, there is first a course of free-hand bench work, the cold-chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 4th shop the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Lectures are given in which the most favorable forms and manipulations of cutting tools and auxiliary appliances are explained.

Previous to the shop work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffiing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation. The following is a detailed view:

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections; their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane, area, surface, and volume of revolution.

Integral Calculus.—Integration of elementary forms and rational

fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

SECOND YEAR.

Advanced Algebra.—Binomial theoem; properties and summation of series; exponential quantities; logarithms; general theory and methods of solving equations.

Advanced tical Geometry.—General discussion of the equation of the second degree; loci in space; the point, right line, and plane; curved surfaces; loci of higher orders; the spirals, logarithmic curve, trochoids, cissoid, etc.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; application.

PHYSICS.

The course of Physics is complete and thorough, embracing the four kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is amply provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, optics and electricity from Stoehrer, of Leipsig, and Browning and Newton, of London; pneumatic and electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes,

also, Browning's electric lamp; and from Eliot Bros., London, resistance coils, galvanometers, etc., for higher researches in electricity.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; Motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and noncircular wheels in rolling contact, cams and curves in sliding contact; gear teeth; gearing chains; escapements; link work.

Analytical Mechanics.—Equations of equilibrium; movements; virtual velocities; centers of gravity; mechanical powers; friction; dynamics.

Hydraulics.—Amount and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains.

Resistance of Materials.—See School of Civil Engineering.

Prime Movers.—The theory and useful effects of turbine water wheels, and best form of the parts for high efficiency. Other water-wheels and wind-wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill-work and Machinery.—Trains of mechanism, studied with reference to their resistence and efficiency; best forms for transmission of power for short and great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective.

Free-hand Drawing.—Sketches of machinery; ornamentation; lettering.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, reduce them to neat and accurate working drawings,

and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the mechanical laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

In strength of materials the student determines the modulus of rupture and the coefficient of elasticy of several kinds of building material. In hydraulics the flow of water through orifices of different form, is studied experimentally. In mechanism each student solves an original problem involving mechanical movements.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop furnished with complete sets of tools, benches, vises, and forges.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French or German.
3. Calculus; Free Hand Drawing; Shop Practice; French or German.

SECOND YEAR.

1. Designing and Construction of Machines; Advanced Algebra; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines, German or French.
3. Advanced Calculus; Astronomy; German or French.

THIRD YEAR.

1. Mechanism and Mechanical Laboratory; Advanced Descriptive Geometry; Chemistry and Laboratory Practice.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Modern History; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geology; Mental Science.
2. Prime Movers; Constitutional History; Construction Drawing.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The School is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text-books, and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid any interference of hours of recitation and because the studies are there given in that order which bests meets the preparation of the student.

NATURAL SCIENCE.

Physics.—See School for Mechanical Engineering. *Chemistry*—Inorganic chemistry and qualitative analysis. *Geology*—Elements of physiographical, lithological, historical, and dynami cal geology.

DRAWING.

Projection Drawing.—Use of Instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades, shadows, and perspective; drawings finished in colors and by right-line shading; bridges; right and oblique arches. *Free Hand*—Landscapes; buildings; lettering and ornamental work. *Topographical*—Sketching; ink drawings, conventional signs, etc. *Mapping*—Railroad, city, and county maps. *Architectural*—Designing and drawing of engineering structures.

TECHNICAL STUDIES.

Astronomy—Descriptive Astronomy is given by lectures with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the astronomical transit, sextant, and engineer's transit adapted to

astronomical work, and by astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges—Calculation of the strains in the king post, queen post, Warren's, Howe's and other trussess, by analytical and graphical methods; and the designing of bridge and roof trusses.

Descriptive Geometry—Problems on the point, right-line and plane; warped surface; perspective; shades and shadows; practical problems.

Geodesy—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; magnetic elements; figure of the earth; projection of maps.

Hydraulics and Mechanics—See School of Mechanical Engineering.

Land Surveying—Areas ; distance; omissions and corrections; metrical system; methods of U. S. public land surveys.

Mathematics—For pure Mathematics see School of Mechanical Engineering.

R. R. Surveying—Economic location; curves; turnouts; crossings; slope stakes; earthworks; grades; curvature of rails; coning of wheels.

Strength of Materials—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Stone Work—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topographical Surveying—Stadia; plane table; level; contours; soundings, etc.

Theory of Engineering Instruments—Examination of workmanship and design; testing instrument maker's adjustments; engineer's adjustments.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topographical survey of a locality is made by the class, in which the stadia and plane-table are used as in the United States surveys.

In the fall term of the third year, the class will execute a project in railroad engineering, which will consist of preliminary surveys, location,

staking out, drawings, computations of earthwork, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurement and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering, will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice—The school is well provided with the instruments necessary for the different branches of engineering field practice, which includes chains, tapes, compasses, plane-tables, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observations, and an astronomical observatory, which is provided with an equatorial telescope, an astronomical transit, with an attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

A portable altitude and azimuth instrument of the latest and best form has lately been received from the celebrated makers, Troughton & Simms, of London. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth. This instrument will be used for instruction in Geodesy and Practical Astronomy.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialities, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photo-lithographs of bridges, roofs, and engineering structures; it has access to the cabinet of the college of engineering, which contains models illustrating wood, stone, and metal construction and a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; French or German.
3. Calculus; Free-Hand Drawing; French or German.

SECOND YEAR.

1. Advanced Algebra; Land Surveying; German or French.
2. Advanced Analytical Geometry; Theory of Instruments and Surveying; German or French.
3. Advanced Calculus; Topographical Surveying and Drawing; German or French.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry and Laboratory Practice; Railroad Engineering.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Mental Science; Geodesy and Practical Astronomy.*
2. Bridges;* Constitutional History; Geology.
3. Stone Work; Political Economy; Bridge Construction.*

MINING ENGINEERING.

Students in Mining Engineering will take the course in metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores, and rocks. In the Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces, and other apparatus required for practical instruction in this department.

In each of these courses the student will take two years of German or French, but not one year of each.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The School prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

INSTRUCTION.

The course embraces the knowledge of theory and principles, of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with references to text-books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed, also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

The course in mathematics, mechanics, physics, etc., is nearly identical with that in the other schools of engineering.

TECHNICAL STUDIES.

Drawing from Casts—Outline sketches and finished drawings in pencil, crayon, and charcoal.

Modeling in Clay—From casts and original designs; weekly exercises in designing architectural ornaments.

Elements of Construction—Lectures; designs for specified problems.

Wood Construction—Frames, roofs, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating, Plastering, Painting, and Plumbing.

Architectural Drawing—Ornaments, moulding; finishing in ink, sepia, and color; working out full sets of drawings for buildings from sketches; practical perspective, and shades and shadows.

Architectural Designing—Original sketches for three projects; two full sets of drawings for buildings for specified private or public purposes.

History of Architecture—Daily lectures on principal styles, characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracings of details; designs for special problems.

Esthetics of Architecture—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings, art objects, furniture, carpets, etc. About twenty-five original designs required for specified objects.

Estimates—Method of measurement, cost of labor and materials, estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products.

Graphical Statics—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such papers must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term.—Carpentry and Joinery. Planing flat, square, and oct-

agonal prisms and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; mitre, lap, and gained joints; through and lap dovetails; mouldings, mitres, and panels.

Second Term.—Turning and cabinet making; cylinders, balusters, capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering, inlaying, carving, and polishing.

Third Term.—Metal work, pattern making, moulding and casting; filing and finishing, drilling, screws, hand and machine turning.

Stone work, executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details, from Lehr, of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof-trusses and stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws; planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentery and Joinery).
2. Stone, Brick, and Metal Construction; Agricultural Drawing; Shop Practice (Stair Building).
3. Estimates, Agreements and Specifications; Heating and Ventilation; Architectural Designing; Shop Practice (Cabinet Making).

ARCHITECTURAL COURSE.

Required for the Degree of B. S., in School of Architecture.

FIRST YEAR.

1. Trigonometry ; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Shop Practice; French.

SECOND YEAR.

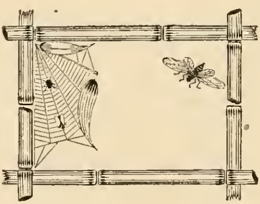
1. Elements ot Construction; Advanced Algebra; Free Hand Drawing and Modeling.
2. Elements of Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Advanced Calculus; Graphical Statics; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Descriptive Geometry and Drawing; Chemistry and Laboratory Practice.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture; Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing; Constitutional History; Geology.
3. Estimates, Agreements and Specifications, Heating and Ventilation; Architectural Designing; Political Economy.



COLLEGE OF NATURAL SCIENCE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR BURRILL, Dean,
PROFESSOR WEBBER,
PROFESSOR TAFT,
PROFESSOR PRENTICE.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in this course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

Text-book instruction in the principles of chemistry and chemical physics occupies six weeks of the first term of the first year. The remainder of the year the recitations alternate with laboratory practice.

During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Text-Books—Roscoe's Chemistry; Douglas & Prescott's Analysis; Fresenius' Analysis; Miller's Chemistry; Rose's Analysis.

Books of Reference—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie: Watts' Dictionary of Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poison.

Four courses of laboratory work have been arranged as follows :

CHEMICAL COURSE.

FIRST YEAR.

First Term.—Qualitative Analysis; Tests and Separation of the Alkalies, Alkaline Earths, $NH_4 2S$ Group, and 1st and 2d Divisions of H_2S Group.

Second Term.—Qualitative Analysis Complete; Tests, and the Separation of 3d Division of H_2S Group, and the Acids; Analysis of 20 Simple Salts, and 20 Compound Substances.

Third Term.—Qualitative Analysis of Sodium Sulphate, Dolomite, Ammonium, Alum, Potassium Chloride, Bone Ash, Iron Ore.

SECOND YEAR.

First Term.—Quantitative Analysis of Calamite (Zinc Carbonate), Copper Pyrites, Galena, Spathic Iron Ore, Nickel Ore, Clay, Soil; Determination of Iron, Copper, etc., both volumetrically and gravimetrically.

Second Term.—Volumetric Analysis; Alkalimetry and Acidimetry; Preparation of Standard Solutions; Analysis of Sodium Carbonate, Sodium Hydroxide, Potassium Hydroxide, Pearl Ash, Cream of Tartar, Sulphuric, Hydrochloric, Oxalic, and Citric Acids; Analysis of Corn and other Grain.

Third Term.—Preparations of Salts, Acids, etc. Electroplating with Silver, Gold, Copper, Nickel.

THIRD YEAR.

First Term.—Ultimate Analysis; Determination of Carbon, Hydrogen, Oxygen, Nitrogen, Chlorine, Phosphorus, and Sulphur in Organic Compounds; Analysis of Urine.

Second Term.—Blow Pipe Analysis; Determination of a collection of minerals representing over thirty of the Metals; Assaying in both the dry and wet way of Gold, Silver, and Lead Ores.

Third Term.—Photography; Preparation of Ether; Absolute Alcohol, Gun Cotton, Cadmium Iodide, Ammonium Iodide, Glacial Acetic Acid, Silver Nitrate, Collodion Taking Negatives, Printing Positives, Toning and Mounting.

FOURTH YEAR.

First Term.—Gas Analysis; Calibration of Eudiometers; Analysis of Air from Lungs, Atmospheric Air, Marsh Gas, Illuminating Gas, and Crude Coal Gas; Analysis of Mineral Waters.

Second Term.—Toxicology; Micro-Chemistry of Poisons; Testing for Mineral and Vegetable Poisons; Separation from Organic Mixtures.

Third Term.—Original Researches.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Commercial Drugs, White Lead, Red Lead, Paris Green, Sodium Nitrate, Oxalic Acid, Tartar Emetic, Commercial Hydrochloric Nitric, and Sulphuric Acids.

Second Term.—Analysis of Mineral Waters; Preparation of Tinctures, Solid and Fluid Extracts; Reading and Compounding Prescriptions.

Third Term.—Isolation of Alkaloids, Atropine, Strychnine, Quinine, Nicotine, Aconitine, Morphine; Preparation of Salycilic Acid; Examination of Alcoholic Liquors; Reading and Compounding Prescriptions.

THIRD YEAR.

First Term.—Same as second term, second year of Chemical course.

Second Term.—Same as first term, third year of Chemical course, without Analysis of Urine; Reading and Compounding Prescriptions.

Third Term.—Preparation of Salts, Perfumes, Flavoring Extracts, Cosmetics; Electroplating with Gold, Silver, Copper, and Nickel.

FOURTH YEAR.

First Term.—Same as second term, fourth year, of Chemical course.

Second Term.—Analysis of Urine, normal and pathological; Reading and Compounding Prescriptions.

Third Term.—Original Researches.

AGRICULTURAL COURSE.

FIRST YEAR.

Same as Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Feldspar, Soil, Ashes of Plants and Grains.

Second Term.—Analysis of Commercial Fertilizers, Manures, and Minerals used for Fertilizers.

Third Term.—Preparation of Organic and Inorganic Salts; Starch from Potatoes, Corn, Wheat, etc., Sugar, Dextrine, Alcohol.

THIRD YEAR.

First Term.—Same as Chemical course.

Second Term.—Analysis of Milk, Corn, Wheat, Potatoes, Fruits, etc.

Third Term.—Silt Analysis of Soils; Analysis of Mineral Waters.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course with the Quantitative Analysis of Brass, Solder, and Type Metal in third term.

SECOND YEAR.

First Term.—Same as Chemical course.

Second Term.—Assaying of Gold, Silver, and Lead Ores, both dry and wet ways; Blowpipe Assaying.

Third Term.—Analysis of Malachite, Azurite, Cinnabar, Tin Ore, Cobalt and Nickel Ore containing Arsenic, Bog Manganese, Grey Antimony.

THIRD YEAR.

First Term.—Analysis of Pig Iron, Wrought Iron, Steel, Furnace Slags, Rolling Mill Slags and Cinders.

Second Term.—Same as in Chemical course, with Analysis of Mineral Waters in place of Assaying.

Third Term.—Same as second term, fourth year, of Chemical course, with Analysis of Coal in place of Mineral Waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected, at an expense, including furniture, of $40,000.

The basement contains a furnace room for assaying and metallurgical operations; a mill room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood and a wash bowl with constant supply of water. There are a spectroscope table, a blowpipe table for general use, and a store room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing eight chemical balances of the manufacture of Bunge (Short Beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by

students in pharmacy; a private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, a coil, battery, mercury, etc.; and a store room with apparatus for all kinds of work in quantitative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Dove's polarizer, with a complete suit of accompanying apparatus; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of areometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen; also a potassium dichromate battery, a galvanometer, a spectroscope, and a large binocular microscope; a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry and Laboratory Practice; Trigonometry; American Authors or French.
2. Chemistry and Laboratory Practice; Analytical Geometry; British Authors or French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

1. Agricultural Chemistry; Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry; Laboratory Practice; Microscopy; German.
3. Laboratory Practice; Zoology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Work; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; Laboratory Work; Logic.
3. Political Economy; Geology; Laboratory Work.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the second year, systematic and structural Botany is continued by illustrated lectures and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the library of the Laboratory. Each student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's) is required. Microscopes and other apparatus are furnished by the University, for which a deposit of three dollars is required, but no charge is made except for damage and material used. The first six weeks are devoted to the study of the natural orders of flowering plants. About twelve lectures are given upon the characteristics of the prominent orders—their geographical distributions, importance, etc., together with the history of a few special plants and their products. During this time, two hours per day. three days per week, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Graminæ, etc., especially such as are best obtained in Autumn. The seventh week is devoted to practical instruction in the use of the compound microscope, and in the preparation of objects. For this, students are furnished with printed directions, and have individual instruction. During the five weeks following, the general morphology of plants, including vegetable anatomy and histology, is studied, there being about ten lectures, and thirty hours of laboratory work. Tests are made from time to time, by the use of disguised vegetable substances. Two weeks are taken for review, finishing drawings, and examination.

The special morphology of the greater divisions of Cryptogamic and

Phænogamic plants, their chief characteristics, their classifications, and the identification of species of Cryptogams, or flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the greenhouses supply specimens in nearly all the groups studied. During the term, there are about twenty lectures, and fifty-four hours of laboratory work, besides review and examination.

The most important books of reference in the English language are Sach's Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cooke's Fungi and Handbook of British Fungi.

Vegetable Physiology is studied in the third term of the first year. The physiological part of Sachs' Botany is made the basis of this instruction, given by lectures with reference to other publications, and with experimental practice. Respiration, assimilation, the circulation of fluids, the influence of light and temperature, growth and reproduction, are some of the topics treated, and sufficiently show the magnitude and importance of the study. Throughout the course, the attempt is made to introduce the student to the literature of the various subjects, and to acquaint them with the authority for the facts stated.

Anatomy and Physiology.—This study commences with the first term of the second year. Anatomy is taught by lectures, aided by works of reference. The human skeleton and manikin are made the basis of comparison in the more extended Zoological researches. Physiology is taught by lectures, in which especial attention is given the subjects of food, digestion, dress, circulation, respiration, ventilation, etc. The senses will be carefully studied, accompanied with suggestions for prolonging their greatest usefulness, that the controllable powers of the body may be preserved with their most efficient activities, to avoid preventable suffering and death, and to secure vigor and happiness.

Zoology continues two terms. In the first, Invertebrate Zoology is studied, unfolding the cardinal facts exemplified in the sub-kingdoms, Protozoa, Cœlenterata, Annuloida, Annulosa, and Mollusca, together with the general principles of respiration, circulation, special methods of reproduction and development; geographical and geological distribution; principles of natural classification, depending upon morphological types, and specialization of the functions, etc.

In the second, Vertebrate Zoology, embracing embryology, the modification of plan by which animals are adapted to the various conditions

of existence, as manifested in their comparative anatomy, followed by Systematic Zoology, that the orders may be recognized at sight, etc. Nicholson's Manual of Zoology is used as a text-book.

Osteology and Taxidermy are taught in extra classes.

Osteology is taken up the winter term, to give the student a practical and theoretical knowledge of the vertebrate skeleton. It consists in laboratory work, alternating daily with a study of the comparative osteological collections in connection with recitations from Flower's Osteology as text. Attention is given to the cleaning and mounting of both ligamentary and articulated skeletons.

Taxidermy is commenced the spring term, and is designed to fit the student for the practical operations of collecting, preserving, and mounting objects of Natural History.

During the early part of the term attention is given to collecting and preparing skins of birds and mammals; the latter part of the term is occupied in mounting specimens from both fresh and dried skins.

Geology.—In Geology, Dana's Manual is used. In the first term instruction is given in Dynamical Geology, which explains the forces known to produce observed phenomena in the crust of the earth; as life, in the formation of lime-stone, coal, peat; water, in eroding, transporting, and depositing material for strata; heat, as manifested in consolidation, metamorphism, and crystalization, as well as in mountain folds on the surface of a shrinking globe.

Lithological Geology is the next term's work. This treats of the kinds, nature, and material of rocks, stratified and unstratified; their mineral constituents; structure, original or induced; concretions, veins, dykes, etc.; methods of determining the chronological order of the strata. Also the historic development of the earth as revealed by

Paleontology, or the study of entombed fossils of the Silurian and Devonian ages. In the third term are discussed the Carboniferous age, with its coal; the reptilian and mammalian ages, with their wonderful inhabitants; the glacial period, with its continents of ice; the later changes reaching to the present time; and, in connection with these subjects, the elements of time; the system of life, the origin of species, the climax in man.

Physical Geography and Meteorology.—The principles of the phenomena manifest in the life of the earth bear the same relation to Geology that Physiology bears to Anatomy. This subject, a result of the facts of Geology, with an application of the laws of Physics, is taught by lectures and works of reference.

Entomology.—After some introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classification. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term three lectures per week are given upon insects, both injurious and beneficial, methods of exterminating, etc., and four hours per week are taken for laboratory work, naming species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study.

Students are required to provide themselves with collecting nets and bottles, pins, and lined boxes, and books for notes. Microscopes and other required apparatus are furnished by the University.

Microscopy and Fungology.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, preparation and mounting of material, etc. The application is mainly, but not exclusively, devoted to minute fungi, including those of the different fermentations and putrefactions. Such fungi as are known or supposed to be injurious to plants or animals are studied as carefully and thoroughly as circumstances permit, specimens being obtained by cultivation and from various other sources.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystallization is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western Plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C.; and others obtained by exchange

from various parts of the United States. A collection of the fungi of the vicinity contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits by Dr. Auzoux, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has first-class microscopes of four different styles from European makes, one by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands were manufactured, from a new design, in the shops of the University.

In *Zoology*, the cabinets contain a human skeleton, and a manikin made by Dr. Auzoux; skeletons of the different orders of mammals, and of birds; stuffed preparations of a large number of birds, mammals, fishes, reptiles, etc.; a dissected eye, trachea and vocal apparatus, in *papier-mache*, by Dr. Auzoux; collections of shells, fossils, and insects.

The Geological Cabinet contains in addition to the specimens from the State Geological Survey, and other illustrative specimens, mineral and fossil, Prof. Ward's celebrated college series of casts of famous fossils, illustrating the various phases of life in geological history. This set of casts was the munificent gift of Emory Cobb, Esq., President of the Board of Trustees.

A valuable and extensive collection of the leads of the State and accompanying mineral, was presented by Gen. J. C. Smith, and other gentlemen, of Galena.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing, (optional); Trigonometry; French.
2. Chemistry; Free-Hand Drawing (optional); Conic Sections; French.
3. Vegetable Physiology; Chemistry, or Free-Hand Drawing; Rhetoric; French (extra).

SECOND YEAR.

1. Anatomy and Physiology; Botany; German.
2. Zoology; Botany; German.
3. Zoology; Economic Entomology; German.

THIRD YEAR.

1. Geology; Mineralogy; German; Ancient History (optional, extra).
2. Geology; Physics; German; Mediæval History (optional, extra).
3. Geology; Physics; Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography; History of Civilization; Mental Science.
2. Microscopy and Fungology; Constitutional History; Logic.
3. Political Economy; Astronomy; Natural History; Laboratory Work.

In this course three terms of University Latin will be accepted in lieu of three terms of French; and five terms of such Latin for five terms of German.

COLLEGE OF LITERATURE AND SCIENCE.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean,	PROFESSOR SHATTUCK,
PROFESSOR PICKARD,	PROFESSOR CRAWFORD,

CHAS. E. PICKARD.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the school of Ancient Languages will be examined also in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody, (Harkness', or Allen and Greenough's); Latin prose composition, (Forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 166, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and diphthongs, and pronunciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, writers, and professors, in their special departments, require a knowledge of the ancient, as well as of the modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the arts. The large liberty allowed in the selection of the special studies of his course will permit the student to give such direction to his education as will fit him fully for any chosen sphere or pursuit.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, proof-reading, and other work intended to illustrate the studies pursued, and exercise the student's own powers. It is designed to give to all the students voice culture and a training in elecutionary practice.

A prominent aim will be to teach the right use of books, and thus prepare the student for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged.

As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of practice in, English Composition, should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with the requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over thirteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on pages 24 and 25.)

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical language. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read the entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times are investigated. Lectures are given

from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English ; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German; to Philology; to the Philosophy of English literature, and to Esthetics. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease, scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage is gained by the student in linguistic culture. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition, and conversation.

Mathematics, Physics, and Astronomy.—For these studies, see School of Mechanical Engineering.

Natural Sciences.—See Schools of Chemistry and Natural History.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the third and fourth years of the University Course.

THIRD YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; General European History; European Geography.

FOURTH YEAR.

Constitutional History of England and the United States; History of ivilization, Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers, and are therefore confined to the fourth year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of preception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful conditious of thought, growth and decay of mental and moral powers. Philosophy of Education, Theory of conscience; nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and in the formation of habits of thinking, and the common judgments of life.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia; French; Trigonometry.
2. British Authors or Livy; French; Conic Sections.
3. Rhetoric; French; Advanced Geometry, or Free-Hand Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology, or Botany.
2. English Classics; German; Zoology, or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History.
2. German; Physics or Chemistry; Mediæval History.
3. German; Physics; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. Early English; Constitutional History; Logic.
3. Philology; Political Economy; Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitution of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year ancient history is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

For the studies in *History, Philosophy, etc.*, see School of English and Modern Languages.

For the studies in *Mathematics and Natural Science*, see Schools of Mechanical Engineering and Natural History.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Boise and Freeman's selections from Greek Authors and prose composition; Conic Sections.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Advanced Geometry.

SECOND YEAR.

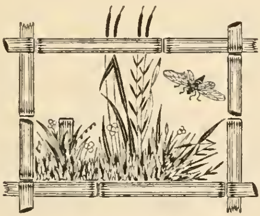
1. Satires of Horace; Thucydides or German; Physiology.
2. Terence; Sophocles or German; Zoology.
3. Tacitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. History of Civilization; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; Early English; Logic.
3. Philology; Geology; Political Economy.



ADDITIONAL SCHOOLS.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR WM. T. WOOD.,

2ND LIEUT. 18TH INFANTRY, U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the college classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc.
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties; Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is now under the charge of Lieut. Wm. T. Wood, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, and is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other courses of study, to allow the members of other courses to enter this. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as captains in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms under careful leaders. Fee 50 cents.

The University Cornet Band is composed of students who while members of the band are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

3. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signalling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signalling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

SCHOOL OF ART AND DESIGN.

Professor Peter Roos.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufacturers, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

Students not seeking a professional training may yet avail themselves of the two years' course in industrial art. Any person of ordinary ability who faithfully completes this course will be qualified to teach drawing and designing in the public schools, or enter professions with great advantage in the various branches of industry, where artistic skill and taste are indispensible to success.

FIRST TERM.

(Exercises in Outline.)

Elements of Form; Analysis of Compound Forms; Elementary Designs; Elementary Perspective by aid of objects; Elements of Historic Ornaments; Memory Exercises.

SECOND TERM.

Enlargement and Shading from copy; Ornamental Designs from plant form; Naturalistic and Conventional Arrangement; Harmonious Lines and Distribution of Form; Perspective Drawing of Objects, Plants, etc.; Features of the Human Head; History of Early Art.

THIRD TERM.

Outline Drawing and Shading from Casts of Ornament; Application of Decorative Forms to flat and round surfaces under various conditions; Designs for specified objects; Advanced Perspective and Shadows; Harmony and Contrast of Color, (Lectures on Art and its History).

FOURTH TERM.

(Clay and Wax Modeling.)

Basso Relievo Ornament from the Solid. Features and the Human Head from description; Relievo Ornament from shaded copies or Drawings; Original Designs for decorative purposes; Enlargements and Reduction from casts; History of Styles of Ornament.

FIFTH TERM.

Shading from Statuary, Casts, etc.; Drawing of Landscape and Animals from copy in Charcoal and Sepia; Color applied to Decorative Art; Designs for useful Objects; Perspective drawings of interiors of Rooms.

SIXTH TERM.

General review of the principal work done; Specimen plates to be completed; Optical and Physical principles of Color in Nature; Aerial Perspective; Sketching from Nature in Charcoal and Color; Artistic Anatomy of Form and Proportion, by illustrated lectures; Famous Artists and their principal works.

Students having passed satisfactorily in the above course will be permitted to enter the advanced classes.

The following course is for those who wish to become accomplished either as designers, painters, or teachers. In order that the student may acquire thoroughness in the branch he wishes to pursue as a speciality, the subject has at this stage been formed into two divisions, decorative and pictorial. The teacher student must give attention to both branches, and with him theory will necessarily supersede practice. Opportunities will be afforded such pupils to teach in the elementary classes whereby greater efficiency will be acquired.

SPECIAL COURSE IN PAINTING.

Trees, Animals, and Figures from copy and from nature in Pencil, Charcoal, and Sepia; Aerial Perspective.

Anatomy of Expression; External muscular development; Shading from Statuary in Charcoal and Monochrome; Composition drawing from description; Memory Exercises.

Water Color Painting from pictures; Sketching from Nature in Sepia and Water Colors; Copying from Oil Paintings of Portraits and Landscapes.

Sketching from Nature in Oil Colors; Rapid studies of interiors with varied arrangement of light and shade; Pictorial composition introducing figures or animals; Theory and History of Art.

Portrait Painting from life; Pictures finished from sketches; Studying of Groups of Still Life Subjects; Painting of ideal compositions of one or more heads; Chemistry of color.

ADVANCED COURSE IN DESIGNING.

Studies in Clay or Wax.

Ornaments and Plant form in Basso Relievo from flat examples; Designs adaptive to useful objects; The Human Figure from cast or original composition, reproduced by casting in metal or plaster; Processes of manufacture; Monumental designs.

Shading from cast and from nature; Classic objects and furniture enlarged from copy; Designs finished with Pen, Brush, and Distempera color; Architectural construction.

Design for Church Decoration in Historic Styles; Memorial Windows for stained glass; Decorative designs; Commemorating events in History; History of manufactures, and important inventions.

ADVANCED TEACHERS' COURSE.

A teacher must be prepared for emergencies for which the professional designer or artist has no experience. A general knowledge of the several subjects is therefore recommended. The decorative and painting courses will be worked together so as to form a thorough course for teachers.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvernay's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudes de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740, Books, 1, 2, 3; Cramer's Studies, Books, 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction term of ten weeks—2 lessons a week	$10.00
For term of ten weeks—one lesson a week	6.00
Practice on piano, one hour daily, per term	2.00

MRS. ABBIE WILKINSON,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents. The studies taught in the preliminary year are as follows:

PREPARATORY STUDIES.

For the Colleges of Engineering, Agriculture, and Natural Science.

First Term.—Algebra—(Olney's) Fundamental rules, Factoring, Common Divisors and Multiples, Powers and Roots, Calculus of Radicals, Simple Equations, Proportion and Progression. *Physiology*—(Dalton's or an equivalent.) *Natural Philosophy*—(Norton's or an equivalent.)

Second Term.—Algebra—Quadratic equations, etc. *Geometry*—Plane Geometry, Lines, Circumferences, Angles, Polygons, as far as equality in Olney's Geometry. *English.*—Elements of Composition. (Gilmore's Art of expression or equivalent.) Orthœpy and Word Analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed, including soli d Geometry and the Sphere. *English* as in the second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin*, Cæsar. *Greek*, Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin*, Cicero's Orations. *Greek*, Xenophon's Anabasis.

Third Term.—Geometry, completed. *Latin*, Virgil's Æneid. *Greek*, the Anabasis.

N. B.—Greek is required only for the School of Ancient Languages. The School of English and modern languages requires Physiology, Natural Philosophy, and Botany instead of Greek.

Students in the preparatory studies are not matriculated as University students. They pay no entrance fee, but are charged a tuition fee of

five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library and of the public lectures.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	H. C. McDougall,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	J. N. Wilkinson,	"
Champaign, East High School	I. L. Betzer,	"
Urbana High School	J. W. Hayes,	"
Oak Park High School	B. L. Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	H. H. Belfield,	"
Chicago W. Division High School	Geo P. Welles,	"
Hyde Park High School	Leslie Lewis, Supt,	
Marengo High School	C. J. Allen,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High School	John T. Hall,	"
Springfield High School	F. R. Feitshans,	"
Monticello High School	H. T. Baker,	"

Warren High School	D. E. Garver,	Principal.
Peru High School	Joseph Carter,	"
Peoria High School	Charles A. Smith,	"
Galena High School	R. L. Barton,	"
Shelbyville High School	Florence B. Webster,	"
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	P. R. Walker,	"
Rossville High School	W. A. Chamberlain,	"
Bement High School	I. N. Wade,	"
Oakland High School	' harles I. Parker,	"
Jacksonville High School	D. H. Harris, Supt.,	
Danville High School	S. Y. Gillan,	"
Marshall High School	D. S. Kilborn,	"
Ottawa High School	H. L. Boltwood	"

EXAMINING SCHOOLS.

The Trustees have authorized the Faculty to designate one or more High Schools in each county of the State, of sufficiently high grade and good reputation, whose certificates of examination, in the branches required of candidates for the University, may be received in lieu of the usual examination of the University.

These must be Graded, or High Schools of good reputation, and of sufficiently extended course to prepare students for the University. The principal teachers of the schools selected will be authorized to prepare questions and conduct examinations of any of their students desirous of entering the University, but the papers must be sent to the University for final decision.

EXAMINING SCHOOLS.

Rockford West High School	W. W. Stetson,	Principal.
Sterling, 2d Ward High School	Alfred Bayliss,	"
Belvidere High School	H. J. Sherrill,	"
Lanark High School	F. T. Oldt,	"
Belleville High School	Henry Raab,	"
Dwight High School	Jesse Hubbard,	"
Macomb High School	J. F. Gowdy,	"
Rantoul High School	N. J. Betzer,	"
Kewanee High School	E. C. Rossiter,	"
Arcola High School	T. C. Clendenin,	"

MISCELLANY.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies, without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as President of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

7. The Degree of Bachelor of letters, B. L., will be given to those who complete the course in the School of English and Modern Languages.

8. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course of the School of Ancient Languages.

9. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued, and passed examinations on, a year of prescribed post-graduate studies, or after a term of successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding houses in Urbana or Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2.00 per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses see page 81.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible, to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill, secure more pay.

Some students, who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

STUDENT'S GOVERNMENT.

For several years an experiment has been in progress, in the self-government of the students of the University. By permission of the Faculty, the General Assembly of the students was organized, and a constitution adopted providing for the election of a President, Vice-President, Secretary, and Marshal; for a Senate of twenty-one members, and a court consisting of a Chief Justice and two Associate Judges. Under this constitution, laws are enacted by the Senate, which become valid only when approved by the Regent and Faculty of the University. All offenses against these laws are tried before the student's court, and punished by fines according to the class of the offense. Students refusing to pay the fines imposed by the student's government, are referred to the Faculty, and if found guilty of an offense, are sentenced to such penalties as the Faculty may deem proper. The government has thus far rendered important aid in maintaining good order in the dormitories and grounds, in preserving public property, in preventing the visiting of saloons, and in other matters requiring the intervention of authority, and above all, in cultivating kindly relations between the Students and Faculty, and a spirit of manliness and self-control.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed:

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 27 and 28.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College. (See page 75.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount $10.00

THE TERM FEE for Incidental Expenses is, for each student......... 7.50

Room Rent in University Dormitory, each student per term $2.00 to 6.00

Each student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $8, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are the estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University.

	MIN.	MAX.
Term Fees and Room Rent for each Student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing, at 75 cents per dozen	13.50	27.00
Total Annual Amount	$124.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$5.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students	10.00
Graduating Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money,* without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

CALENDAR FOR 1882 83

Examinations for Admission	Monday,	September 11
First or Fall Term begins	Wednesday,	September 13
First Term ends	Wednesday,	December 20

WINTER VACATION.

FOR 1883.

Examination for Admission to Advanced Classes	Tuesday,	January 2
Opening of the Second or Winter Term	Wednesday,	January 3
Anniversary Day		March 11
Second Term ends	Wednesday,	March 21
Third or Spring Term begins	Wednesday,	March 21
Baccalaureate Address in University Chapel	Sunday,	June 3
Class Day	Monday,	June 4
Alumni Day	Tuesday,	June 5
Commencement	Wednesday,	June 6

SUMMER VACATION.

Examinations for Admission	Monday,	September 10
First or Fall Term begins	Wednesday,	September 12

LIST OF GRADUATES.

1872.

NAME.	OCCUPATION.	RESIDENCE.
Burwash, Milo B	Farmer	Champaign
Davis, John J, B S	Physician	Racine, Wis
Drewry, Henry N	Lawyer	Effingham
Flagg, Alfred M, Capt	Lawyer	Sioux Falls, Dak
Hatch, Miles F	Lumberman	New Lacoma, W T
Hill, Edgar L, Capt	Farmer	Watson
Lyman, George H	Civil Engineer	New Madrid, Mo
Mathews, James N	Physician	Mason
Reiss, Willis A	Teacher	Belleville
Reynolds, S A, Capt	Lawyer	Chicago
Ricard, Thomas E, Capt	Farmer	Springfield
Ricker N Clifford, M Arch	Professor of Architecture, Illinois Industrial University.	Champaign
Rolfe, Charles W, M. S	Instructor of Mathematics and Botany, Illinois Industrial University.	Champaign
Silver, Howard	Principal Public Schools.	Hutchison, Kan
Silver, Charles W	County Superintendent of Schools.	Newton, Kan
Teeple, Jared	Merchant	Marengo
Wharton, Jacob N	Machinist	Bement
Whitcomb, Alonzo L	Physician	Camargo
Wood, Reuben O, Capt	Farmer	Woodburn

NOTE.—Graduates who have the rank as Captain have received commissions from the Government of the State as Captain in the Illinois National Guard.

1873.

NAME.	OCCUPATION	RESIDENCE.
Graham, Charles P	Clergyman	New Salem, Kan
Hatch, Frederick L	Farmer	Blivins Mills
Hayes, Charles I, B S		Argentine, Col
Superintendent Mining Works.		
Hennessey, Augustus L	Editor	Chicago
Hook, Samuel H	Miner	Black Hills, Col
Morrow, Andrew T	Farmer	Touganoxie, Kan
Ockerson, John A, B S		Sunflower, Miss
Engineer U. S. Lake and River Survey.		
Phillips, Parley A	Farmer	Damascus
Platt, Franklin C, Capt	Lawyer	Don City, Iowa
Porterfield, Elijah N	Civil Engineer	Carmi
Robbins, Henry E	Teacher	Lyons, Iowa
Principal Public Schools.		
Swartz, Alexander C, C E	Farmer	Beulah, Kan
Williams, Lewis E	Farmer	Montrose, Iowa

1874.

Baker, Ira O, C E		Champaign
Professor of Civil Engineering, Illinois Industrial University.		
Campbell, John P	Druggist	Enfield
Drewry, Ebenezer L.	Lawyer	Effingham
Eaton, Herbert	Farmer	Philo
Ells, William C		Strong City, Kan
Superintendent Construction A, T. & S. F. R. R.		
Estep, Harvey C	Civil Engineer	Olympia, W T
Foster, Charles W	Lawyer	Chicago
Gabrialial, Gregory	Missionary	Asia Minor
Gennadius, Panagiottis, B S		Athens, Greece
Commissioner of Agriculture.		
Jeffers, Charles P	Druggist	Swampscott, Mass
Pierce, John L, B A	Lawyer	Champaign
Pickrell, William	Farmer	Beatrice, Nebraska
Reynolds, Henry S, M S	Assayer	Wickes, Mon Ter
Storey, George	Civil Engineer	San Diego, Cal
Smith, Charles A, B S	Civil Engineer	Terre Haute, Ind
Wharry, Walter W, Capt		Sycamore
Agent Elwood Manufacturing Company.		
Watts, William	Physician	Sylvania, O
Cheever, Alice	Mrs A. H. Bryan	Champaign
Potter, F. Adelia	Mrs H S Reynolds	Wickes, Mon Ter

1875.

NAME.	OCCUPATION.	RESIDENCE.
Barnes. Arthur E, B S	Druggist	Topeka, Kansas
Brown, Dillon S	Druggist	Genoa
Brown, Ralph L, M L	Teacher	Wyandotte, Kan
Principal of Public Schools.		
Coddington, Vantile W	Architect	Kansas City, Mo
Dobson, Franklin P, Capt	Civil Engineer	Parker, Dakota
Dunlap, Henry M	Farmer	Savoy
Dunlap, Burleigh A	Lawyer	Urbana
Eaton, Ernest	Editor	Champaign
Everhart, Winfield S, Capt	Lawyer	Toledo
Faulkner, James, Capt		Sebastopol, Col
Principal Public Schools.		
Gridley, George N	Farmer	Half Day
Kenower, George F, M L		Mascoutah
Principal Public Schools.		
Leplar, John E	Clergyman	Leavenworth, Kan
Lyford, Charles C, B S	Veterinary Surgeon	Minneapolis, Minn
McCauley, John C	Teacher	Montezuma, Ind
Muller, John	Physician	Monticello, Miss
Parsons, Fernando A, M L	Banker	Harper, Kansas
Patch, Emory	Machinist	Janesville, Wis
Pickrell, Watson	Farmer	Beatrice, Nebraska
Pollock, William C	Lawyer	Mt Vernon
Robinson, Elna A	Mechanic	Champaign
Scovell, Melville A, M S		Champaign
Professor of Agricultural Chemistry, Illinois Industrial University.		
Scudder, Clarence O		Dixon
Principal Public Schools.		
Shawhan, George R, B L		Homer
County Superintendent of Schools, hampaign County.		
Warner, L Fenn		Martinez, Cal
ivil Engineer, Central Pacific Railroad.		
Anderson, Laura	Mrs J R Greenhalgh	Champaign
Campbell, Amanda	Mrs Milton Moore	Philo
Kellogg, Flora L	Teacher	Coldwater, Iowa
Lee, Alice, B L	Mrs V M Coddington	Kansas City, Mo
Pierce, Fannie	At home	Champaign
Stewart, Maggie E, B L	Mrs H E Robbins	Lyons, Iowa
Steele, Mary C, B L	Mrs N C Ricker	Champaign

1876.

NAME.	OCCUPATION.	RESIDENCE.
Allen, Ralph	Farmer	Delavan
Ballou, Edward L	Mining	Igo, Cal
Campbell, James W	Lawyer	Topeka, Kan
Chandler, William B	Farmer	Bourbon
Clark, Charles W	Civil Engineer	St Louis Land'g, Ark
Drake, James F	Lawyer	Kokoma, Cal
Gill, John D	Lawyer	Chicago
Gore, Simeon T	Architect	Ashley
Gregory, Charles E, Capt	Druggist	Rochelle
Knibloe, Walter E	Teacher	Girard
Mackay, Daniel S	Lawyer	Mt Carroll
Mackay, Henry J	Lawyer	Mt Carroll
Mackay, William D, Capt	Lawyer	Mt Carroll
Mahan, H Weston	Merchant	Champaign
Mann, Frank I, Capt	Nurseryman	Gilman
*Mann, A Howard	* April 23, '79	Winnebago, Cal
Mann, James R, Capt	Lawyer	Chicago
Noble, Louis R, B S, Capt	Engineer	The Dalles, Oregon
Oliver, William F, Capt	Physician	Longton, Kan
Palmer, Frank M, Capt	Lawyer	Clinton
Pierce, Elon A	Teacher	Belmond, Iowa
Rhodes, James F	Lawyer	Durango, Col
Scribner, Artemus C	Commissioner	Minneapolis, Minn
Starr, Frank A E, Capt	Superintendent of Schools, Douglas county.	Tuscola
Stookey, D Wesley	Tile Manufacturer	Buffalo
Weston, Charles H	Lawyer	Chicago
*Wild, George A, Capt	* Nov 1881 at	Las Animas, Col
Williams, Thomas T	Farmer	Sterling
Holton, Mattie S	Mrs C I Hayes	Champaign

1877.

Abbott, Theodore S, B S	Civil Engineer	Laredo, Texas
*Allen, Charles W, B L	* July 8, 1880	Harristown
Barry, Charles H, Capt	Insurance Agent	Chicago
Barry, Frank, B L, Capt	Clerk	St Louis, Mo
Blackall, C H, M Arch, Capt	Architect	New York City
Brush, Charles E	Architect	Carbondale
Buckingham, William	Lawyer	Chicago

NAME.	OCCUPATION.	RESIDENCE.
Bumstead, James E	Physician	Dundee
Clay, Luther G	Nurseryman	Cobden
Crow, Benjamin F	Engineer	Nebraska City, Mo
Elliott, Charles G	Civil Engineer	Tonica
Faulkner, Richard D	Principal Public School.	Ophir, Cal
Gibson, Charles B, Capt	Chemist	Chicago
Gilkerson, Hiram, Capt	Farmer	Hampshire
Gilkerson, John	Law Student	Springfield
Kennedy, Allan G, Capt	Lumber Merchant	Eau Claire, Wis
Llewellyn, Joseph C	Superintendent Street Railroad.	St Louis, Mo
Lewis, Edward V, Capt	Cashier	Chatham
McPherson, John	Engineer	Lexington, Ky
Moore, John F	Carpenter	Davenport, Iowa
Rice, George C	Principal Public Schools.	Muncie
Seymour, John J	Engineer	Seymour
Sim, Cole L, Capt	Druggist	Topeka, Kan
Spence, Franklin	Farmer	Nauvoo, Ill
Stayman, John M	Clerk	Council Bluffs, Iowa
Stoddard, Ira J, Capt	Civil Engineer	Pella, Iowa
Ward, Walter P, B L	Farmer	Terre Haute, Ind
Whitham, R F, B L, Capt	Farmer	Olympia, W T
Wright, Myron J	Farmer	Woodstock
Adams, Nettie	Teacher	Tolono
Bogardus, Eva	At Home	Champaign
Broshar, Cornelia	Artist	Champaign
Conn, Emma	At Home	Champaign
Falls, Ida Bell	Teacher	Champaign
Gregory, Helen B, B A	Artist	Chicago
Maxwell, Emily C	At Home	Philadelphia, Pa
Page, Martha	Mrs R F Whitham	Olympia, W T
Piatt, Emma C, B S	At Home	Monticello
Skinner, Velma E	Teacher	Mahomet
Smith, Avice	Physician	Champaign
Switzer, Gertrude	Music Teacher	Champaign
Victor, Carrie	Teacher	Champaign

1878

NAME	OCCUPATION.	RESIDENCE.
Baker, Edward J, B S	Farmer	Savoy
Ballard, Charles, B S	Lumber Merchant	Kansas City, Mo
Bridge, W E, B S, Capt	Farmer	Sedan, Kan
Brown, Frank A	Teacher	
Bullard, Samuel A, B S	Architect	Springfield
Burr, Ellis M, B S	Machinist	Champaign
Coffman, Noah B, B S	Cashier	Hebron, Neb
Dean, Frank A, Capt	Merchant	Ulysses, Neb
Gaffner, Theodore	Physician	Trenton
Gregory, A T, B A, Capt	Civil Engineer	Albuquerque, N M
Hauser, Henry, B S, Capt	Civil Engineer	San Marcial, N M
Lee, Elisha O, B S	Lawyer	Mt Carroll
Lloyd, Frank H	Merchant	Champaign
McLane, James A, B S	Architect	Chicago
Moore, Aaron H		
Morava, Wensel, B S, Capt	Machinist	Chicago
Patchin, John	Teacher	Chicago
Pollock, James L, B L	Lawyer	Mt Vernon
Richards, Charles L, B S	Farmer	Woodstock
Rudy, William D, B S	Clerk	Washington, D C
Rutan, Abram R	Farmer	Renton, Texas
Sawyer, Hamlin W, Capt	Farmer	Champaign
Savage, Manford, B L	Lawyer	Hebron, Neb
Sparks, Hosea B, Capt	Clerk	Alton
*Spradling, William F	*Nov 30, 1881	Greenleaf, Kan
Sprague, Martin	Lawyer	Springfield
Weed, Mahlon O, B S	Teacher	South Bend, Neb
Whitlock, J F, B L, Capt	Medical Student	Chicago
Ziesing, August, B S, Capt	Civil Engineer	Pittsburg, Pa
Columbia, Emma	Mrs J R Mann	Chicago
Culver, Nettie M, B L	At Home	Henry
Davis, Nannie J	Mrs M A Scovell	Champaign
Estep, Ida M	Clerk	Olympia, W T
Estep, Jessie	At Home	Rantoul
Larned, Mary S	Mrs F A Parsons	Harper, Kan
Mahan, Jennie C	Mrs P W Plank	Champaign
Page, Emma, M L	At Home	Champaign
Page, Mary L	Architect	Streator

1879.

NAME.	OCCUPATION.	RESIDENCE.
Beardsley, Henry M, M L	Law Student	Champaign
Bourne, Henry P, B S	Civil Engineer United States River Survey.	Cairo
Butler, William N, Capt	Law Student	Chicago
Coburn, R P, B S. Capt	Merchant	San Antonio, Texas
Freijs, Charles T, Capt	Architect	Chicago
Gunder, James, B S	Civil Engineer	Gunnison, Col
Hoit, Otis W, B S	Farmer	Geneseo
Johnson, William P, Capt	Merchant	Chicago
Kays, Emery	Farmer	Tonica
Kimble, Willis P, B S	Civil Engineer	El Paso, Texas
Kuhn, Isaac, B S	Merchant	Prescott, Arizona
Lee, Elisha, B S	Farmer	Hamlet
Milton, Franklin S, B S		Jerseyville
Stanton, S C, B S, Capt	Physician	England
Swannell, Arthur, Capt	Merchant	Kankakee
Taft, Lorado Z, M L	Art Student	Paris, France
Thompson, W A, B S, Capt	Merchant	Chicago
Walker, Francis E, Capt	Merchant	La Moille
Whitmire, Clarence L	Law Student	Iowa City, Iowa
Butts, Augusta E, B S	Teacher	Paxton
Deardorf, Sarah C, B S	Teacher	East Lynne, Mo
Hale, Belle, B S	Teacher	Stillwater, Mich
McAllister, Nettie C, B L	Mrs J H Miller	Sandwich

1880.

Bley, John, B S	Machinist	Hartford, Conn
Briles, Bayard S	Merchant	Etna
Conklin, Roland R	Loan Agent	Kansas City, Mo
Cook, Charles F, B S	Merchant	Edwardsville
Groves, Charles	Teacher	Champaign
Hafner, Christian F	At Home	Oak Park
Harden, Edgar E	Lawyer	Beatrice, Neb
Hatch, Frank W, B L	Law student	Chicago
Heidenheimer, Benj F	Draughtsman	Chicago
Jones, Richard D	Law Student	Henry
Kingsbury, Charles S, B L	Teacher	Sidney
Neeley, Charles G, B L	Clerk	Du Quoin
Parker, William L, B S	Patent Agent	Chicago

NAME.	OCCUPATION.	RESIDENCE.
Robinson, Arthur S, B S	Draughtsman	Las Vegas, N M
Robinson, Albert F, B S	Civil Engineer	Chicago
Sondericker, Jerome, B S		Champaign
Instructor in Drawing, Illinois Industr al University.		
Savage, George M, B L	Teacher	Fairbury, Mo
Travis, William W	Law Student	Bloomington
White, Frank, B S	Teacher	Stillman Valley
Bacon, Kittie I, B L	Teacher	Champaign
Batchelder, Augusta	At Home	Harristown
Lucas, Corda	Teacher	Camargo
Parker, Minnie A, B L	Teacher	Tuscola
Pearman, Ida, B L	Mrs C E Stevens	Logansport Ind
Watson, Ella M, B S	Teacher	De Kalb

1881.

Allison, James G	Clerk	Chicago
Armstrong, James E, B S		Champaign
Instructor in Natural History, Illinois Industrial University.		
Beach, Bayard E, B L	Clerk	Champaign
Bellamy, Albert	Clerk	Girard
Birney, Frank L	Medical Student	Urbana
Boothby, Arthur, B S	Farmer	Pittsfield
Boyd, Comma N, Capt	Farmer	Sheffield
Coddington, Arch O, B L	Teacher	Wyandotte, Kan
Cooper, Frederick E, B S	At Home	Girard
Davis, Arthur E, B L	Telegrapher	Crawfordsville, Ind
Dennis, C H, B L, Capt	Reporter	Chicago
Dressor, John C, B S	Farmer	Cottonwood Grove
Forsyth, James	Student	Champaign
Hammett, F W, B S, Capt	Farmer	Camargo
Hill, Fred L	Surveyor	Pullman
Hill, T C, B A, Capt	Teacher	Tolono
Kingman, Arthur H	At Home	Wakefield, Mass
McKay, Francis M, B L		Chicago
Principal West Jackson St. Public School.		
Mansfield, Willis A, B L		Albion, Neb
Mason, William K, B S	Farmer	Buda
Morse, John H, Capt	Teacher	Metamora
Pearman, J Ora, B S	Medical Student	Champaign
Philbrick, E, B S, Capt	Draughtsman	Chicago
Pepoon, Herman S, B S	Medical Student	Chicago
Pepoon, William A	Clerk	Fremont, Neb

NAME.	OCCUPATION.	RESIDENCE.
Pletcher, Francis M, B S	Teacher	Lewisburg, Kan
Porter, Frank H, Capt		Jamestown, Dak
Ross, Sprague D, B S		Cottonwood Grove
Schwartz, Joseph	Druggist	Salem
Seymour, ArthurB, B S	Naturalist	Normal
Slade, Byron A, B S, Capt	Clerk	Wabasha, Minn
Stacey, Morelle M, B L	Teacher	Princeton
Sturman, James B, B L	Teacher	Yorkville
Talbot, A N, B S, Capt	Engineer	La Junta, Col
Weston, William S, B L	Student	Champaign
Wilson, Maxwell B	Farmer	Paris
Baker, Kittie M	Music Student	Chicago
Barnes, Bertha E, B L	Teacher	Champaign
Davis, Marietta, B L	Music Teacher	Monticello
Elder, Loretta K, B L	At Home	Chicago
Hammett, Jennie M, B S	At Home	Camargo
Lawhead, Lucie M, B L	Teacher	Champaign
Lawrence, Nettie E	At Home	Belvidere
Macknet, Metta M I, B A	At Home	Girard
Thomas, Darlie, B L	Clerk	Bloomington
Wright, Jessie A, B L	Teacher	Champaign

1882.

Candidates for graduation at the approaching Commencement.

Bailey, Samuel G, jr, B S.......................Chicago
Barnes, Charles C.......................Champaign
Bridge, Arthur M.......................La Moille
Bullard, Benjamin F, B L.......................Mechanicsburg
Bullard, George W, B S.......................Springfield
Carman, William B, B L.......................Urbana
Cole, Edward E.......................Champaign
Craig, William P.......................Champaign
Curtiss, William G.......................Warren
Davis, Jeptha H.......................Monticello
Eichberg, David, B L.......................Atlanta
Eisenmayer, Andrew J, B S.......................Trenton
Harrison, Samuel A, B A.......................Alton
Merritt, Charles H.......................Waterman
Neely, John R, B L.......................Du Quoin

NAME.	RESIDENCE.
Noble, Thomas	Todd's Point
Orr, Robert E, B S	Champaign
Peabody, Arthur, B S	Champaign
Palmer, Charles W, B L	Watseka
Richards, George W, B S	Quincy
Roberts, Charles N, B S	Jefferson
Rugg, Frederic D, B L	Champaign
Sharp, Abia J, B S	East Lynne, Mo
Slaudeman, Frank, B S	Decatur
Slauson, Howard, B S	Bloomington
Smith, Charles L, B L	Champaign
Spencer, Nelson S, B S	Champaign
Taft, Florizel A, B S	Champaign
Todd, James, B S	Elgin
Turner, Herbert	Quincy
Wadsworth, John G	Madison, Dakota
Andrus, Dora A, B L	Ashton
Avery, Kitty C, B L	Champaign
Cole, Fronia R	Champaign
Raley, Arvilla K	Granville

LEARNING AND LABOR.

Catalogue and Circular

OF THE

Illinois Industrial University,

Urbana, Champaign County, Ill.

1882-83.

CHAMPAIGN:
GAZETTE STEAM PRINT.

1883


STATE
SOVEREIGNTY.
NATIONAL
UNION

Faculty.

SELIM H. PEABODY, Ph. D., LL. D.,
REGENT, and Professor of Mechanical Engineering and Physics.

THOMAS J. BURRILL, M. A., Ph. D.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

GEORGE E. MORROW, M. A.,
Professor of Agriculture.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

PETER ROOS,
Professor of Industrial Art and Designing.

WILLIAM T. WOOD,
SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

WILLIAM McMURTRIE, E. M., Ph. D.,
Professor of Chemistry.

BENJAMIN C. JILLSON, M. D., Ph. D.,
Professor of Geology and Zoology.

CECIL H. PEABODY, B. S.,
Assistant Professor of Mechanical Engineering.

EDWIN A. KIMBALL,
Foreman of Machine Shop.

NELSON S. SPENCER, B. S.,
†Foreman of Carpenter Shop.

JEROME SONDERICKER, B. S.,
Instructor in Right Line Drawing.

CHARLES W. ROLFE, M. S.,
Instructor in Mathematics and Botany.

EDWARD A. MORSE, M. A.,
Instructor in Ancient Languages.

† Resigned at end of Winter Term.

MRS. ABBIE WILKINSON,
Teacher of Vocal and Instrumental Music.

HOWARD SLAUSON, B. S.,
First Assistant in Chemical Laboratory.

ARTHUR W. PALMER,
Second Assistant in Chemical Laboratory.

GEORGE W. PARKER,
Foreman of Carpenter Shop, Spring Term.

A. B. BAKER,
Janitor.

List of Students.

RESIDENT GRADUATES.

NAME.	RESIDENCE.
Bogardus, Eva	Champaign.
Seymour, Arthur B, B S.,	Camp Point.
Sondericker, Jerome, B. S.,	Woodstock.
Taft, Florizel A., B. S.,	Champaign.
Weston, William S., B. L.,	Champaign.

SENIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Edward L	Civil Engineering	Union Grove.
Adams, Charles F	Natural History	Champaign.
Bogardus, C Eugene	Chemistry	Champaign.
Brainard, Clarence	Civil Engineering	Buda.
*Chapman N W	Civil Engineering	Gerlaw.
Craig, William P	Lit. and Science and Mil.	Champaign.
Durfee, Elisha B	Literature and Science	Marion, Ohio.
Gates, Alphonso S	Civil Engineering	Hamilton.
Going, Judson F	Lit. and Science and Mil.	Warren.
Goltra, William F	Civ. Engineering and Mil.	Bourbonnias Gr
Gray, Nelson A	Lit. and Science and Mil.	Champaign.
Haven, Dwight C	Lit. and Science and Mil.	New Lenox.
Heath, William A	Literature and Science	Champaign.
Hewes, George C	Chemistry	Farmer City.
Huey, Joseph D	Natural History	Clement.
Kenower, John T	Chemistry	Clement.
Lewis, Ralph D	Civil Engineering	Champaign.
Little, Henry P	Chemistry	Champaign.
*North, Foster	Natural History	Kewanee.

NAME.	COURSE.	RESIDENCE
McCune, Henry L	Lit. and Science and Mil.	Ipava.
Moore. William D	Mech. Engineering	Chatham.
Palmer, Arthur W	Chemistry	Springfield.
Peirce, Fred D	Chemistry and Military	Polo.
Piatt. Silas H	Chemistry	Monticello.
*Postel, Julius	Ancient Languages	Mascoutah.
Scotchbrook. Geo P	Civil Engineering	Morrison.
Sondericker, William	Ancient Languages	Woodstock.
Weis, Joseph	Chemistry	Tonica.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ashby, Lida	Literature and Science	Champaign.
Boggs, Hattie M	Ancient Languages	Tuscola
Colvin, Mary S	Literature and Science	Mt. Palatine.
Fellows, Clara B	Literature and Science	Millbank, Dak.
Gardner, Jessie	Literature and Science	Champaign.
Healey. Grace	Literature and Science	Champaign.
Knowlton. Lizzie A	Literature and Science	Urbana.
Langley, M Celeste	Literature and Science	Champaign.
Lewis, C Florence	Literature and Science	Farmer City.
Peabody, Kate F	Literature and Science	Champaign.
*Smith, Laura B	Literature and Science	Champaign.
Stewart, Ella M	Literature and Science	Champaign.
Wright, Minnie E	Literature and Science	Champaign.

JUNIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, William L	Mech. Engineering	Union Grove.
Austin, James	Civil Engineering	Altona.
*Ayres, Judson F	Chemistry	Urbana.
Babcock. Guy H	Agriculture and Military	Ridott.
*Bacon, George H	Literature and Science	Champaign.
*Barber, Henry H	Civil Engineering	Savanna.
*Barmm. Charles E	Chemistry	Chicago.
Bartholf Emmett G	Ancient Languages	Plainfield.
*Bartholf William J	Ancient Languages	Plainfield.

NAME.	COURSE.	RESIDENCE.
Braucher, Arthur C	Civil Engineering	Lincoln.
*Braucher, William B	Mechanical Engineering	Lincoln.
*Burt, Angelo R	Mechanical Engineering	Dubuque, Iowa.
*Cole, T Edward	Elective	Champaign.
*Dunlap, Robert L	Chemistry	Savoy.
Eberlein, Fred W	Chemistry	Mascoutah.
Eliel, Albert L	Mechanical Engineering	LaSalle.
French, George H	Civil Engineering	Milton.
*Haas, Solomon I	Architecture	Savanna.
Herdman, Frank E	Mech Eng. and Military	Zanesville, Ohio
Hermann, David	Civil Engineering	Highland.
Hunt, Thomas F	Agriculture	Ridott.
*Kimball, Edwin R	Chemistry and Military	Champaign.
Lantz, Milo P	Elective and Military	Oak Grove.
Lietze, Frederic A	Civil Engineering	Carlyle.
Lilly, Charles H	Chemistry	Champaign.
*Lilly, James E	Ancient Languages	Champaign.
*North, Arthur T	Architecture	Kewanee.
*McCluer, George W	Agriculture	Farina.
*McEathron, Wm J	Civil Engineering	Lena.
Marshall, John H	Ancient Languages	Charleston.
Montezuma, Charles	Chemistry	Chicago.
*Morgan, George N	Literature and Science	Kinmundy.
*Morse, E Leland	Civil Eng. and Military	Cazenouia.
*Odell, Arthur M	Civil Engineering	East Dubuque.
*Parr, Samuel W	Chemistry	Normal.
Peart, George K	Civil Engineering	Braidwood.
Philbrick, Solon	Lit. and Science and Mil.	Baileyville.
Roberts, Lewis C	Mech. Eng. and Military	Jefferson.
*Roberts, Vertus B	Elective and Military	Plainfield.
*Rupp, Andrew O	Civil Eng. and Military	Chenoa.
Sizer, Lucius N	Civil Eng. and Military	Mahomet.
Speidel, Ernst	Chemistry	Rock Island.
*Spencer, Howard M	Architecture	Dixon.
Stannard. Albert C	Chemistry and Military	Champaign.
Stevens, Hubert A	Civil Engineering	Chicago.
*Stratton, Samuel W	Literature and Science	Litchfield.
Van Petten, Henry S	Chemistry	Chillicothe.
Vial, Edmund R	Agriculture	Western Springs.
*Vial, Frederic K	Agriculture	Western Springs
West, Charles H	Civil Eng. and Military	Greenville, Miss

Whittemore, Benj M	Lit. and Science and Mil.	Charleston.
Wills, Jerome G	Literature and Science	Sailor Springs.

LADIES.

NAME.	COURSE.	RESIDENCE.
*Ayers, Nettie	Literature and Science	Urbana.
*Barber, Ella U	Literature and Science	Champaign.
Braucher, Alma E	Natural History	Lincoln.
Campbell, Juniata G	Literature and Science	Polo.
Conklin, Anna J	Literature and Science	Champaign.
*Clark, Lucy J	Ancient Languages	Champaign.
Ellis, Lola D	Literature and Science	Canton.
Fuller, Ruth W	Literature and Science	Montague, Mass.
Hall, Lucy A	Literature and Science	Champaign.
*Hall, Nira M	Art and Design	Metamora.
*Hill, Cora J	Literature and Science	Paxton.
Kemball, Georgetta	Literature and Science	Champaign.
*Krause, Josephine	Literature and Science	Chicago.
*Lewis, Georgetta L	Literature and Science	Champaign.
Ranney, Frances L	Literature and Science	Cazenovia.
Sim, Keturah E	Literature and Science	Urbana.
*Somers, Cora	Literature and Science	Urbana.

SOPHOMORE CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Allen, Aleck M	Architecture	Champaign.
Allen, E Wright	Agriculture	Harristown.
*Baxter, Thomas L	Mech. Engineering	Chicago.
*Boller, Chester E	Architecture	Lexington.
Boring, William A	Architecture	Alton.
Brown, George M	Mech. Engineering	Dixon.
*Carter, Harry L	Mech. Engineering	Humboldt.
Clark, William B	Chemistry	Worthington, Pa
Colton, Samuel K	Architecture and Military	Chicago.
Colton, Simeon C	Civil Engineering	Chicago.
Cook, Curtin	Chemistry	Tolono.
*Corwin, Cecil S	Architecture	Racine, Wis.

NAME.	COURSE.	RESIDENCE.
Davis, James O	Civil Engineering	French Grove.
Ellis, George H	Chemistry	Milwaukee, Wis
Gregory, Grant	Literature and Science	Champaign.
Greeley, George H	Mech. Engineering	Waterman.
*Hatch, Henry D	Ancient Languages	Plainfield.
Hicks, George L	Literature and Science	Warren.
Hopper, Charles S	Literature and Science	Bristol.
Huber, Otto	Literature and Science	Rock Island.
Kendall, William F	Civil Engineering	Rock Island.
Kent, James M	Mech. Engineering	Kewanee.
Krause, Frederic F	Mining Engineering	Chicago.
Lattin, Judson	Mech. Eng. and Military	Sycamore.
*Lee, Scovell	Agriculture	Millersburg.
*Manns, Albert G	Chemistry	Chicago.
Marshall, Sherman L	Lit. and Science and Mil.	Ipava.
*Mathers, George B	Civil Engineering	Mason City.
Miller, John A	Chemistry	Buffalo, N. Y.
*Miller, William B	Mech. Engineering	Hyde Park.
Moffett, William D	Civ. Engineering and Mil.	Decatur.
*Moore, George F	Mech. Eng. and Military	Polo.
*Parker, W H	Literature and Science	Oswego.
*Pearman, Ira E	Literature and Science	Champaign.
Peterson, Harry G	Civil Engineering	Champaign.
Petty, George R	Civil Engineering	Pittsfield.
*Randolph, T F	Chemistry	Canton.
*Rankin, Charles H	Civil Engineering	Fall Creek.
Reynolds, Henry L	Mech. Engineering	Camp Point.
Ronalds, Hugh L	Mech. Engineering	Grayville.
Schleder, Theo. H	Civil Engineering	Greenvale.
Schrader, Alfred C	Civil Engineering	New Lenox.
*Scott, John A	Elective	Champaign.
Sherrill, Frank A	Civ. Engineering and Mil.	Belvidere.
*Smith, Tracy A	Elective	Wilmington.
*Smith, William H	Literature and Science	Salem.
Stockham, Wm H	Mech. Eng. and Military	Chicago.
Swern, William C	Architecture	Marshall.
Taggart, James S	Agriculture	Ridott.
*Taylor, John F	Civil Engineering	Taylor.
*Whitmire, Z L	Natural History	Metamora.
Woodworth, Chas. W	Chemistry	Champaign.
Wright, John E	Literature and Science	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Clark, Kate F	Natural History	Cobden.
*Cumberland, H	Literature and Science	Champaign.
Earle, Mary T	Natural History	Cobden.
*Hays, Gertrude	Literature and Science	Urbana.
*Jones, Emma T	Literature and Science	Champaign.
*McNary, Margaret E	Literature and Science	Pana.
*Maltby, Cora	Literature and Science	Champaign.
Owens, Bessie W	Literature and Science	Urbana.
Parrill, Lizzie	Elective	Farina.
*Plank, Bessie G	Literature and Science	Champaign.
*Scoggins, M Alice	Literature and Science	Champaign.
*Switzer, Lottie	Literature and Science	Champaign.
Reed, E May	Literature and Science	Frankfort, Kan.
Thomas, Fanny	Literature and Science	Kickapoo.
Way, Ada B	Literature and Science	Champaign.
Weston, Abbie	Literature and Science	Champaign.
Wright, Lizzie M	Literature and Science	Champaign.
Wright, Minnie S	Literature and Science	Plainfield.

FRESHMAN CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Alfred N	Agriculture	Union Grove.
Arnold, C Herbert	Agriculture	Ulah.
Ashby, William M	Literature and Science	Champaign.
Babcock, William A	Literature and Science	Ipava.
Baelz, George	Literature and Science	Metamora.
*Bannister, Geo. S	Architecture	Odell.
Barrett, Dwight H	Chemistry	La Moille.
Bishop, John F	Architecture	Champaign.
*Blakeslee, C E	Mech. Engineering	DuQuoin.
Blandy, Douglass C	Mech. Engineering	Zanesville, Ohio
Braucher, Edward R	Mech. Engineering	Lincoln.
Brown, Simon	Civil Engineering	Grant Fork.
*Bullard, S Foster	Architecture	Mechanicsburg.
*Burt, Frank A	Mech. Engineering	Dubuque, Iowa
Chitty, William L	Literature and Science	Champaign.

NAME.	COURSE.	RESIDENCE.
Clark, Arthur S	Architecture	Champaign.
Cromwell, John C	Mech. Engineering	Frankfort, Ky.
*Cummings, H B	Chemistry	Buda.
Dodds, Joseph C	Ancient Languages	Sadorus.
Earle, Charles T	Chemistry	Cobden.
Edwards, Frank R	Civil Engineering	Aledo.
Endsley, Lee	Literature and Science	Milford.
*Everhart, T W B	Ancient Languages	Champaign.
Fulton, James	Civil Engineering	Eureka.
*Grubb, Edwin S	Literature and Science	Springfield.
Harris, James W	Civil Engineering	Blackberry.
*Henshaw, Charles	Civil Engineering	Knightstown, Ind
*Herrington, D E	Mech. Engineering	Greenwood.
Hubbard, Henry T	Literature and Science	Urbana.
*Johnson, Ralph M	Chemistry	Champaign.
Jones, John W	Mech. Engineering	Bodega, Cal.
Kutnewsky, Chas. F	Mech. Engineering	Groveland.
Latham, Ector B	Mining Engineering	Atlanta, Ga.
Lumley, Clinton G	Literature and Science	Ringwood.
*McCune, Myron Q	Literature and Science	Ipava.
McGregor, Wm G	Mech. Engineering	Chicago.
Mackey, John L	Mech. Engineering	Mt. Carroll.
Marquiss, John A	Natural History	Monticello.
Maxwell, William W	Literature and Science	Champaign.
*Meredith, Wynn	Elective	Aurora.
Millar, W Edwin	Civil Engineering	Mattoon.
Milnes, George S	Chemistry	Morrison.
*Moffett, Ocea E		Modesto.
Morse, Henry M	Mech. Engineering	Cazenovia.
*Olshausen, W A G	Mech. Engineering	Davenport, Iowa.
Pease, James F	Agriculture	Quincy.
*Percival, Orin	Literature and Science	Champaign.
Philbrick, Alvah	Civil Engineering	Baileyville.
*Pillsbury, Ithamar	Mining Engineering	Macomb.
Richards, Albert L	Mech. Engineering	Burton.
Samson, John F	Literature and Science	Sidney.
Shlaudeman, Harry	Architecture	Decatur.
*Sickels, F Henry	Literature and Science	Champaign.
*Sims, David P	Chemistry	Champaign.
*Smith, DeWitt	Literature and Science.	Galesburg.
Smith, Elijah S	Elective	Champaign.

NAME.	COURSE.	RESIDENCE.
*Speidel, Hugo	Civil Engineering	Rock Island.
Robison, Elmer C	Agriculture	Tremont.
Vanderlip, Frank	Elective	Aurora.
Walker, Frank W	Literature and Science	Robinson.
*Wallace, John B	Elective	Champaign.
Wilder, Henry W	Ancient Languages	Champaign.
*Williams, Chas. H	Literature and Science	Farm Ridge.
*Woodward, E M	Literature and Science	Odin.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayres, L Belle	Literature and Science	Urbana.
Boggs, Estelle	Literature and Science	Tuscola.
Elder, Nettie	Literature and Science	Urbana.
Ermentrout, A Mae	Literature and Science	Urbana.
Fairchild, Rozina P	Literature and Science	Metamora.
*Gilkerson, Ida M	Literature and Science	Marengo.
Huff, Bertie	Literature and Science	Champaign.
Jaques, Minnie	Literature and Science	Urbana.
*Lilly Fannie	Literature and Science	Champaign.
McClain, Mary E	Literature and Science	Urbana.
Merboth, Louisa	Literature and Science	Spring Bay.
Oliver, Bertha R	Literature and Science	LaSalle.
Parminter, Grace E	Literature and Science	Metamora.
Paullin, Estelle	Literature and Science	Atlanta.
Sharp, Emma G	Natural History	East Lynne, Mo.
Ranney, Esther J	Literature and Science	Cazenovia
Wills, Etta C	Literature and Science	Sailor Springs.
Zeller, Josephine M	Literature and Science	Spring Bay.

PREPARATORY CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Allison, William B		Macomb.
Andrews, Eugene	Civil Engineering	Lincoln.
Bailey, Frank A	Civil Engineering	Monmouth.
Barclay, William	Civil Engineering	East Wheatland.

NAME.	COURSE.	RESIDENCE.
Bay, John M	Chemistry	Millersburg.
Brayton, Ira S		Blue Island.
Bridges, Charles	Civil Engineering	Mattoon.
Bryden, William J		Monticello.
Caldwell, Frank W	Chemistry	Cisco.
Cannady, Stephen D	Chemistry	Logan, Mo.
Carr, Alfred N	Literature and Science	Macon,
Castle, John E		Ridge Farm.
Clark, William A	Literature and Science	Rossville.
Conkey, Carl A		Homer.
Cope, Walter L	Agriculture	Salem.
Corwin, Arthur M	Civil Engineering	Racine, Wis.
Craig, Jesse	Architecture	Pulaski, Iowa.
Dickinson, Frank H	Literature and Science	Danvers.
Donlan, Patrick H	Literature and Science	Ruthven, Iowa.
Evarts, John L	Natural History	Yorkville.
Fairchild, James D		Springfield.
Fargusson, Mark	Civil Engineering	Chicago.
Folger, Adolphus		Ridge Farm.
Francis, John R		Dudley.
Funk, Clarence P	Civil Engineering	Plainfield.
Gaines, James E	Mech. Engineering	Middletown.
Gilbert, Franklin M	Mech. Engineering	Bryan, Texas.
Gill, Rudolph Z		Urbana.
Goodrich, Leonard		Champaign.
Goodwin, Phil A	Civil Engineering	Wilmington.
Gwinner, Bennie F	Ancient Languages	Canton, Miss.
Gwinner, Henry	Mech. Engineering	Canton, Miss.
Hankins, Walter A	Architecture	Argenta.
Hart, David S	Mech. Engineering	Paradise.
Haven, S Rush		New Lenox.
Hayes, William K	Civil Engineering	Plattville.
Hillis, George S	Chemistry	Hillsboro.
Hoppin, George B	Literature and Science	White Oak.
Hull, Lucius M	Elective	Godfrey.
Hutchinson, Wm H	Civil Engineering	Rantoul.
Lee, Charles H	Elective	Seneca, Kan.
Lemme, Emil	Architecture	Davenport, Iowa.
Lloyd, William B	Natural History	Arcola.
Nicky, John M	Civil Engineering	Oakley.
McCulloch, Chas S	Mech. Engineering	Champaign.

NAME.	COURSE.	RESIDENCE.
Mack, Roscoe D	Mech. Engineering	Paris.
Marshall, X S	Elective	Centralia.
Morehouse, Henry C	Agriculture	Summit.
Munns, Andrew C		Parkville.
O'Neal, Robert	Architecture	Carrollton, Ky.
Paxton, Charles M	Agriculture	Kansas.
Pease, Chester I		Marion.
Plowman, William L	Literature and Science	Virden.
Powers, Mark	Natural History.	Fayetteville, Mo.
Prunk, Frank H	Mech. Engineering	Indianapolis, Ind.
Scott, Archie R	Literature and Science	Champaign.
Simons, Burton R		Oswego.
Smith, Edward A	Chemistry	Morrison.
Smith, Robert E	Agriculture	Athens, Ala.
Sperry, Eldridge H		Champaign.
Sperry, Fred B	Chemistry	Anna.
Stewart, Walter	Chemistry	Wilmington.
Strong, Joe	Agriculture	Keithsburg.
Richardson, Fred S	Mech. Engineering	Janesville, Wis.
Robertson, Henry W	Ancient Languages	Compromise.
Rogan, John E		Carlyle.
Tatarian, Bedros	Agriculture	Constantinople, Turkey.
Taylor, Horace	Elective	Nokomis.
Trowe, John F		Dwight.
Tunnell, Frank W	Chemistry	Edwardsville.
Vail, James E	Ancient Languages	Industry.
Wallace, Edward H		Mt. Jackson, Pa.
Webster, Adelbert W	Literature and Science	Poplar Grove.
Whitcomb, Carrol S	Agriculture	Chicago.
Wilbanks, Frank		Mt. Vernon.
Wilhoit, Pope	Elective	Kansas.
Wilkinson. Dan'l L	Literature and Science	Edgar.
Willard, Reuel		Wilmington.
Young, William F		Oswego.
Zimmerman, H	Agriculture	Bunker Hill.

LADIES.

NAME.	COURSE.	RESIDENCE.
Armstrong, Jennie R	Literature and Science	Tuscola.
Brayton, Minnie E		Blue Island.
Bullard, Julia	Literature and Science	Mechanicsburg.
Burr, Fannie C	Literature and Science	Philo.

NAME	COURSE.	RESIDENCE.
Fisher, Fannie F		Ridge Farm.
Fisher, Virginia B	Literature and Science	Ridge Farm.
Folger, Ida	Literature and Science	Ridge Farm.
George, Alice A	Literature and Science	Crescent City.
Hall, Ida	Elective	Metamora.
Hammett, Laura	Literature and Science	Camargo.
Hill, Addie M		Paxton.
Neagle, Julia A		Ivesdale.
Neely, Kate	Literature and Science	DuQuoin.
Moss, Lucretia O		Champaign.
Oliver, Florence M	Literature and Science	LaSalle.
Page, Luella E		Allerton, Iowa.
Paxton, Anna	Elective	Kansas.
Paxton, Lillian	Elective	Kansas.
Shepherd, Jessie A	Literature and Science	Hennepin.
Willard, Adele J	Literature and Science	Plainfield.

SPECIAL STUDENTS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bosworth, Walter E	Agriculture	Marseilles.
Earle, Frank S	Botany	Cobden.
Grimm, Edgar	Agriculture	Corvallis, Oregon.
Johnston, Charles	Agriculture	Dewey.
Lester, Ballard P	Agriculture	Penfield.
Mathers, Eugene	Agriculture	Mason City.
Page, Charles A	Horticulture	Metamora.
Peddicord, Edwin S	Agriculture	Marseilles.

LADIES.

NAME.	COURSE.	RESIDENCE.
Castle, Clara A	Art and Design	Ridge Farm.
Merritt, Jennie	Art and Design	Champaign.
Moore, Lutie T	Art and Design	Champaign.
Morris, Ida M	Art and Design	Pesotum.
Shattuck, Mrs S W	Art and Design	Champaign.
Wallace, Mary D A	Art and Design	Champaign.

Summary.

BY CLASSES.	GENTLEMEN.	LADIES.	TOTAL.
Resident Graduates	4	1	5
Seniors	28	13	41
Juniors	52	17	69
Sophomores	53	18	71
Freshmen	64	18	82
Preparatory	80	20	100
Special	8	6	14
Total	289	93	382

BY COURSES.	GENTLEMEN.	LADIES.	TOTAL.
Agriculture	28		28
Mechanical Engineering	39		39
Civil Engineering	52		52
Mining Engineering	3		3
Architecture	18		18
Chemistry	40		40
Natural History	7	4	11
Art and Design		7	7
English and Modern Languages	48	69	117
Ancient Languages	13	2	15
Elective	14	4	18
Not Specified	23	6	29
	285	92	377
Resident Graduates	4	1	5
Total	289	93	382

Illinois Industrial University.

HISTORY.

THE Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this state to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also has made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, until four Colleges, including ten distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1779. The number graduated from the several Colleges, including the class of 1882, is 336. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1877 its exhibit at the Paris International Exposition gained a diploma and the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The county is a

region of beautiful rolling prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house.

The Main University Building, designed wholly for public uses, occupies three sides of a quadrangle, the frontage being 214 feet and upon the wings 122 feet. The Library wing is fire-proof and contains in spacious halls the Museum of Natural History, the Library, the Art Gallery, and the Museum of Engineering. The Chapel wing contains the Chapel, the Physical Laboratory and Lecture Room, and rooms for draughting and drawing. In the main front are convenient class-rooms; on the upper floor, elegant halls for literary societies. The building is warmed by steam from a boiler house which forms the fourth side of the quadrangle in the rear.

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler, forge and tank room; a Machine Shop, furnished for practical use with a steam engine, lathes and other machinery; pattern and finishing shops, shops for carpentry and cabinet work, furnished with wood-working machinery; paint and draughting-rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also supplied with gymnastic apparatus. One of the towers contains an armoror's shop and an artillery room; the other contains a printing office and editor's room.

The Chemical Building, erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 25,000 acres of well selected lands in Minnesota

and Nebraska. It has also endowment funds invested in State and county bonds amounting to $319,000, besides other property and avails valued at $33,000.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich and equalled at few, if any, of the colleges of the west. Among these collections are included the following:

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils obtained from Germany, with collections of fossils of this and other States, illustrates the different formations, and is suitably arranged for practical study. There is a good collection of foot-prints from the Connecticut sand-stones.

Conchology.—A large collection of shells fully illustrating the principles of conchology as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals, with the single exception of the order of proboscidea; also typical representatives of the amphibious reptiles and of fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivors and fur bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of the grasses and sedges. There are besides many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees and shrubs of Stephenson County, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks ; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized ; these, with a complete set of imported models, fully illustrate crystallography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States ; many varieties of corn, wheat, and other cereals and seeds ; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized ; a collection of grains, seeds, nuts, etc., from Brazil ; some hundreds of models of agricultural inventions ; models illustrating modes and materials for drains ; casts of ancient plows ; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—Tne Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

A series of standard weights and measures has been received from the office of the Coast and Geodetic Survey of the U. S. Government and may be consulted at the Physical Laboratory.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, drill presses, and the requisite hand tools benches, vices, anvils, etc., for pattern-shop, blacksmith-shop, moulding room and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work shops of the University.

MiningE ngineering is illustrated by a valuable series of models, obtained from Freiburg, illustrating sections of mines, machinery for

elevating and breaking ores, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture, it embraces thirteen full size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

Museum of Engineering and Architecture.—A large room is devoted to the gathering of a museum of practical art, the materials for which have been constantly accumulating in the various schools of science. It will contain full lines of illustrations of the work of the shops ; models made at the University and purchased abroad ; drawings in all departments ; patent-office models, etc.; samples of building materials, natural and artificial ; with whatever may be secured that will teach or illustrate in this most important phase of University work.

A notable feature of the collections is the gift of Henry Lord Gay, Architect of Chicago. It consists of a model in plaster, and a complete set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first King of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was to have been seven and a quarter millions of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for political reasons. Mr. Gay's generous gift will occupy the place of honor in the Museum of Engineering and Architecture.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 13,000 volumes, and additions are made every year.

4

The large library hall, fitted up as a reading room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study is encouraged or required. The reading-room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received :

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Country Gentleman.
Breeder's Gazette.
Indiana Farmer.
New England Farmer.
Michigan Farmer.
Farmer and Fruit Grower.
Iowa Homestead.
Agricultural Gazette, *London.*
Gardner's Chronicle, *London.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal.
Horticulturist.
Farmer's Review
Veterinary Journal.

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Engineering, *London.*
Builder, *London.*
Skizzen-buch, *Berlin.*
American Engineer.
Transactions American Society of Civil Engineers.
Engineering News.
Engineering and Mining Journal.
Scientific American.
Scientific American Supplement.
Sanitary Engineer.
Van Nostrand's Engineering Magazine
The Workshop.
American Architect.
American Machinist.
Western Manufacturer.
Gazette of Patent Office.

SCIENTIFIC.

Annales des Sciences Naturelles, *Paris.*
Science.
Nature, *London.*
American Naturalist
Grevillea, *London.*
Comptes Rendus, *Paris.*
American Journal of Pharmacy.
The Druggist.
Chemical News, *London.*
Journal of Chemical Society, *London.*
American Journal of Chemistry.
Boston Journal of Chemistry.
Jahrbericht der Chemie, *Giessen.*
Zeitschrift fur An. Chemie.
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
Journal of Franklin Institute
Journal de Mathematiques.
Mathematical Quarterly.
Mathematisches Journal.
Monthly Weather Review.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review.
Contemporary Review.
Fortnightly Review.
North American Review.
Atlantic Monthly.
Century.
Library Journal.
Literary World.
American Journal of Education.
Education.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Princeton Review.
United Service Magazine.
Nation.
Congressional Record.
American Protectionist.
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Musical Record.
Signal.

The exchanges of the *Illini* are also free to the students in the Library.

Aims of the University.

THE University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature :

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships, as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges, which are sub-

divided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.
School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.

School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, and Elocution are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required:—that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physiography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and Designing, Elements of Construction, Graphical Statics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, on the two days previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric Composition. These are required, in addition to the subjects specified in 1 and 2, for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy, Latin Grammar and Reader. Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, in addition to the subjects of 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also "*Preliminary Year.*"

COUNTY SUPERINTENDENT'S CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches, Arithmetic, Geography, English Grammar, and History of the United States; applicants who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

College of Agriculture.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean,
PROFESSOR BURRILL,
PROFESSOR PRENTICE,
PROFESSOR McMURTRIE.
PROFESSOR JILLSON.

ADMISSION.

CANIDATES for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. Tho better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many ,who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that

man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming —of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning, and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops —cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; Laws especially effecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: Orchard sites, the Age of Trees to Plant, the Season to Plant, How to Plant, What to Plant, the Management of the Soil, Pruning and Care of Trees, Gathering and Preserving Fruit, Diseases and Injuries, the Nursery, Ornamental Trees and Shrubs, Flower Gardens, Vegetable Gardens including Propagating Beds and Houses, the Vineyard and Small Fruits, and Timber Tree Plantations. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the College. Excursions are made when found practicable for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for specially horticultural pursuits and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of

growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Plant Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the Domestic Animals is taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are also given on

Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the agricultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines, their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and Special Investigations by each student. A Thesis is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorolegy, see statements in *College of Natural Science.*

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, and several breeds of swine, to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture under the direction of the Professors of Agriculture and of Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The Barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The Barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large wind-mill which furnishes power for grinding feed, and for other purposes.

A Veterinary Hall and Stable has been provided, and a Clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and teeth of the horse at different ages.

Surveying and Drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College, there are: 1. A very large specimen apple orchard planted in 1869, and containing about 1,000 varieties,—many varieties of pears, cherries, grapes, and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An aboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different material and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house, contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models elastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture; hemistry; Trigonometry; Shop Practice (optional).
2. Elements of Horticulture; Chemistry; British Authors, or Free Hand Drawing.
3. Economic Entomology; Chemistry; Rhetoric.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Botany; German.
2. Agricultural Chemistry (Soils and Plants); Zoology or Botany; German.
3. Agricultural Chemistry; (Tillage, Fertilizers, Foods); Vegetable Physiology; German.

THIRD YEAR..

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; German.
2. Animal Husbandry; Veterinary Science; Veterinary Materia Medica. (optional extra); Physics or Geology.
3. Landscape Gardening; Veterinary Science; Physics or Geology.

FOURTH YEAR.

1. Physiography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 32 and 33.

FARMER'S COURSE.

Students who can not give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Economic Entomology or Landscape Gardening.

College of Engineering.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean,
PROFESSOR SHATTUCK,
E. A. KIMBALL,
PROFESSOR BAKER,
PROFESSOR C. H. PEABODY.
J. SONDERICKER.

SCHOOLS.

MECHANICAL ENGINEERING, ARCHITECTURE,

CIVIL AND MINING ENGINEERING.

ADMISSION.

APPLICANTS should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a textbook, and the drawings made on smooth paper, eight by ten inches.

STUDIES PURSUED BY ALL ENGINEERING STUDENTS.

The subjects common to all the schools in the College of Engineering will be described first: the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between the trigonometrscal functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

Advanced Algebra.—Functions and their notation; series and the theory of limits; imaginary quantities; general theory of equation.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane, area, surface, and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc.; algebraic curves.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; the point, right line, plane, and surface of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications; elements of elliptic integrals.

PHYSICS.

The course of Physics embraces the kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, optics and electricity from Stoehrer of Leipsic, and Browning and Newton of London; pneumatic and electrical apparatus from E. S. Ritchie of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Bros., London, resistance coils, galvanometers, etc., for higher researches in electricity.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective; drawing of machines, bridges, roofs, etc., finished by line shading, tints, and colors.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering.—Plain and ornamented alphabets; titles and title-pages; round and stump writing.

Descriptive Geometry.—Problems on the point, right-line and plane; warped surface; perspective; shades and shadows; practical problems.

APPLIED MATHEMATICS.

Analytical Mechanics.—Polygon of forces; equations of equilibrium of moments; center of gravity; moment of inertia; acceleration, work, momentum, impact; motion of free particles; central forces; constrained motion.

Strength of Materials.—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Hydraulics.—Amount and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises.

For manuscripts and unimportant drawings, a heavy flat-cap paper.

For ordinary drawings, not colored, a heavy, first-quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right line drawings, and lettering, the best three-ply Bristol board. For problems, exercises, lecture notes, theses, and other manuscripts, and for geometrical projection, topographical, railroad, typographical, and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used it must be cut 8x10 inches, and the binding margin hinged on with muslin.

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink or colors. It must be upon regulation paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labeled with donors' names, and placed in the Museum of Engineering and Architecture, for the inspection of students and the illustration of lectures.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The state needs

men who to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the mechanical Laboratory, is counted as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and by text books. Examples are given showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensious of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents four different shops, viz:

1—Pattern Making.
2—Blacksmithing.
3—Bench Work for Iron.
4—Machine Tool Work for Iron.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made, from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, there is first a course of free-hand bench work, the cold-

chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 4th shop the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Lectures are given in which the most favorable forms and manipulations of cutting tools and auxiliary appliances are explained.

Previous to the shop work, drawings of the pieces are made by the student and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact, cams and curves in sliding contact gear teeth; gearing chains; escapements; link work.

Prime Movers.—The theory and useful effects of turbine water-wheels and best form of the parts for high efficiency. Other water-wheels and wind-wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill-work and Machinery.—Trains of mechanism, studied with reference to their resistence and efficiency; best forms for transmission of power for short or great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the mechanical laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop furnished with complete sets of tools, benches, vises, and forges.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French or German.
3. Advanced Algebra; Free Hand Drawing; Shop Practice; French or German.

SECOND YEAR.

1. Calculus; Designing and Construction of Machines; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German or French.
3. Advanced Calculus; Astronomy; German or French.

THIRD YEAR.

1. Mechanism and Mechanical Laboratory; Advanced Descriptive Geometry; Chemistry
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Modern History; Physics.

FOURTH YEAR,

1. Prime Movers; Resistance of Materials and Hydraulics; Mental Science.
2. Prime Movers; Construction Drawing; Constitutional History.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which

will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text books and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid interference of hours of recitation and because the studies are there given in that order which best meets the preparation of the student.

TECHNICAL STUDIES.

Astronomy—Descriptive Astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the altazimuth instrument, the astronomical transit, the sextant, and the engineer's transit adapted to astronomical work, and by astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges—Calculations of stresses in the various forms of bridge-trusses, by algebraic and graphical methods, consideration being given to weights of bridge and train, and force of wind; designing trusses, and proportioning sections.

Geodesy—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; projection of maps.

Land Surveying—Areas and distances, by chain, compass, and plane table; omissions and corrections; metrical system; methods of U. S. public land surveys; magnetic variation; determination of true meridian.

Rail-road Surveying—Economic location; curves and grades, and their inter-adjustment; earthwork; curvature and elevation of rail; easement curves; turnouts; crossings; maintenance of way.

Stone Work—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topography—Use of stadia, plane-table, and level; contours; soundings. Sketching, mapping, conventional signs; city and county maps.

Theory of Engineering Instruments—Examination of workmanship and design; testing instrument maker's adjustments; engineer's adjustments, determination of areas with transit; inaccessible and air line distances; profiles; heights and distances with stadia; measurement of angles with sextant, etc.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane-table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topographical survey of a locality is made by the class, in which the stadia and plane-table are used as in the United States surveys.

In the fall term of the third year the class will execute a project in railroad engineering which will consist of preliminary surveys, location, staking out, drawings, computations of earthwork, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering, will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice—The school is well provided with the instruments necessary for the different branches of engineering field practice, which includes chains, tapes, compasses, plane-tables, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observations, and an astronomical observatory, which is provided with an equatorial telescope, an astronomical transit, with an attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton & Simms, of London, is used for instruction in Geodesy and Practical Astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room—The school has numerous models for illustrating its specialties, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photo-lithographs of bridges, roofs, and engineering structures; it has access to the Museum of Engineering and Architecture, which contains models illustrating wood, stone, and metal construction and a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; French or German.
2. Analytical Geometry; Discriptive Geometry and Lettering; French or German.
3. Advanced Algebra; Free-Hand Drawing; French or German.

SECOND YEAR.

1 Calculus; Land Surveying; French or German.
2. Advanced Analytical Geometry; Theory of Instruments and Surveying; French or German.
3. Advanced Calculus; Topographical Surveying and Drawing; French or German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry; Railroad Engineering.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1 Resistance of Materials and Hydraulics; Geodesy and Practical Astronomy*; Mental Science.
2. Bridges;* Geology; Constitutional History.
3. Stone Work; Bridge Construction*; Political Economy.

MINING ENGINEERING.

Students in Mining Engineering will take a course in metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores, and rocks. In the Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces, and other apparatus required for practical instruction in this department.

In each of these courses the student will take two years of German or French, but not one year of each.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory is has the following position :

Latitude 40° 6′ 29″.6
Longitude, West of Washington, $\left\{ \begin{array}{l} 11^\circ\ 10'\ 37''.5 \\ 44\text{m. } 42.5\text{s.} \end{array} \right.$
Elevation above sea-level, 720ft

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The school prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

INSTRUCTION.

The course embraces the knowledge of theory and principles, of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with reference to text-books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed; also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

TECHNICAL STUDIES.

Drawing from Casts—Outline sketches and finished drawings in pencil, crayon, and charcoal.

Elements of Drawing—Lectures; designs for specified problems.

Wood Construction—Frames, roofs, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating, Plastering, and Plumbing.

Sanitary Construction—Scientific principles and practical methods employed in plumbing, water supply, and drainage of buildings.

Architectural Drawing—Finishing in line, ink, sepia, and color; working out from sketches full sets of drawings for building; practical perspective, and shades and shadows.

Architectural Designing—Original sketches for specified projects; one full set of drawings for buildings for specified private or public purpose.

History of Architecture—Daily lectures and recitations on principal styles, their characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracing of details; designs for special problems.

Esthetics of Architecture—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings; art objects, furniture, carpets, etc. About twenty-five original designs required for specified objects.

Estimates—Methods of measurement, cost of labor and materials, estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products. Problems and applications to specified buildings.

Graphical Statics—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such plates must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term—Carpentry and Joinery. Planing flat, square, and octagonal prisms and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; miter, lap, and gained joints; through and lap dovetails; mouldings, miters, and panels.

Second Term—Turning and cabinet making; cylinders, balusters capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering; inlaying, carving, and polishing.

Third Term—Metal work, pattern making, moulding and casting, filing and finishing, drilling, screws, hand and machine turning.

Stone work executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr, of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof-trusses and stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws; planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

BUILDER'S COURSE.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making).

ARCHITECTURAL COURSE.

Required for the Degree of B. S., in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Graphical Statics; Shop Practice; French.

SECOND YEAR.

1. Elements of Wood Construction; Advanced Algebra; Free Hand Drawing and Modeling.
2. Elements of Stone, Brick, and Metal Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Elements of Sanitary Construction; Advanced Calculus; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Descriptive Geometry and Drawing; Chemistry.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture; Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization
2. Architectural Designing; Heating and Ventilation; Constitutional History.
3. Architectural Designing; Estimates, Agreements and Specifications; Political Economy.

College of Natural Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR BURRILL, Dean,
PROFESSOR MCMURTRIE,
MR. ROLFE,
PROFESSOR PRENTICE,
PROFESSOR JILLSON,
MR. SLAUSON.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

ADMISSION.

CANDIDATES for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in this course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

The first term of the first year is occupied by text-book instruction and lectures on the elementary principles of chemistry, chemical physics,

and inorganic chemistry. The second term is devoted to laboratory practice in qualitative analysis. In the third term recitations upon organic chemistry alternate with laboratory practice in qualitative analysis. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Text-Books—Roscoe's Chemistry; Fresenius' Analysis; Bolton's Analysis; Sutton's Volumetric Analysis; Bunsen's Gasometry; Rickett's Assaying; Gore's Electro-metallurgy; Johnson's How Crops Grow and How Crops Feed.

Books of Reference—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Roscoe and Schorlemmer's Treatise on Chemistry; Armstrong's Miller's Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poisons.

Five courses of laboratory work have been arranged as follows:

CHEMICAL COURSE.

FIRST YEAR

First Term.—General theoretical and applied chemistry. Lectures and text-book.

Second Term.—Qualitative analysis begun; tests and separation of the bases and acids.

Third Term—Qualitative analysis completed. Examination of 20 simple salts and 20 compound substances, natural and commercial products. Organic chemistry. Text-book and recitations.

SECOND YEAR.

First Term.—Qualitative analysis of Barium chloride, Magnesium sulphate, Ammonio-ferric sulphate, Potassium-sodium tartrate, Sodium phosphate, calcite, Silver coin, nickel nitrate, Copper arsenite. Duplicate determinations in each case. Preparation of salts

Second Term.—Qualitative analysis of calamite, lime-stone, spathic iron ore, copper pyrites, galena, nickel ore, clay, soil. Preparation of salts.

Third Term.—Volumetric analysis, Preparations of standard solutions, alkalimetry and acidimetry, analysis of Sodium hydroxide, Sodium carbonate, Potasium hydroxide, cream of tartar, hydrochloric, sulphuric, nitric, oxalic, and acetic acids; of iron, copper, silver, zinc, lead. Preparation of salts.

THIRD YEAR.

First Term—Ultimate organic analysis. Determination of carbon, hydrogen, nitrogen, chlorine, phosphorus and sulphur in organic compounds. Analysis of urine. Preparations.

Second Term—Assaying in both the dry and wet way of gold, siver, and lead ores. Electro-plating with silver, gold, copper and nickel. Preparations.

Third Term.—Analysis of commercial fertilizers, phosphates, nitrogenous matters, and alkaline salts. Analysis of milk, butter, cheese, corn, wheat, potatoes, fodder. Examination of alcoholic liquors. Preparations.

FOURTH YEAR.

First Term.—Gas Analysis. Calibration of Eudiometers. Analysis of air from beings, atmospheric air, marsh gas, illuminating gas, crude coal gas. Analysis of mineral water. Preparations.

Second Term.—Toxicology. Micro-chemistry of poisons. Testing for mineral and vegetable poisons. Separation from organic mixtures. Preparations.

Third Term.—Original researches. Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in chemical course.

Second Term.—Quantitative analysis of commercial drugs, white lead, Paris green, Bismuth subnitrate, tartar emetic, Sodium bicarbonate, Potassium nitrate, Ammonium carbonate, cream tartar, commercial hydrochloric, nitric, and sulphuric acids. Preparations.

Third Term.—Same as in chemical course.

THIRD YEAR.

First Term.—Same as in chemical course.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs, oils, resins, gums, alkaloids, glucosides, etc. Examination of alcoholic liquors.

Third Term.—Materia Medica. Reading and compounding perscriptions. Preparation and valuation of tinctures and extracts. Examination of commercial organic drugs.

FOURTH YEAR.

First Term.—Analysis of urine, normal and pathological. Mineral waters. Examination of alcoholic liquors.

Second Term.—Toxicology. Micro-chemistry of poisons. Separation of poisons from organic mixtures.

Third Term.—Original researches. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

Arranged for students desiring to make a specialty of this branch.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Barium chloride, Magnesium sulphate, Ammonium sulphate, Calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term.—Analysis of ashes of plants, soil, mineral waters.

Third Term.—Analysis of commercial fertilizers, manures and minerals used for manures, apatite, phosphates, guanos, nitrates.

THIRD YEAR.

First Term.—Same as in chemical course, omitting analysis of urine. Analysis of corn, wheat, and fodder.

Second Term.—Analysis of milk, butter, cheese. Analysis of sugars by polariscope and by titration. Examination of alcoholic liquors

Third Term.—Original researches.

COURSE IN AGRICULTURAL CHEMISTRY.

Especially arranged for students in the School of Agriculture.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative analysis of Barium chloride, Ammonium sulphate, Calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term.—Analysis of soil, ashes of plants, commercial fertilizers, manures, and materials employed in their production, apatite, phosphates, guanos, animal matters, ammonia salts, nitrates, and marls.

Third Term.—Analysis of corn, wheat, hay, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course, omitting organic chemistry in third term.

SECOND YEAR.

First Term.—Quantitative Analysis of Barium chloride, Magnesium sulphate, Ammonio-ferric alum, nickel nitrate, silver coin, brass, type metal, solder.

Second Term.—Analysis of calamine, spathic iron ore, magnetic iron ore, copper pyrites, galena, nickel ore, manganese ore, cinnabar, grey antimony.

Third Term.—Analysis of slags from copper, zinc, and lead; iron furnace and mill slags.

THIRD YEAR.

First Term.—Analysis of pig iron, wrought iron, steel, commercial copper, lead, zinc, bullion.

Second Term.—Assaying. Same as in Chemical course.

Third Term.—Analysis of fuels, wood, anthracite and bituminous coals, coke, determination of heating power. Analysis of ashes and furnace cinders; mineral waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height has been erected, at an expense, including furniture, of $40,000.

The basement contains a furnace-room for assaying and metallurgical operations; a mill-room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture-room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood and a wash bowl with constant supply of water. There are a spectroscope table, a blowpipe table for general use, and a store-room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing eight chemical balances of the manufacture of Bunge (short beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; a private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus; a coil, battery, mercury, etc; and a store room with apparatus for all kinds of work in quantiative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of arometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen and a potassium dichromate battery; a galvanometer; a spectroscope; a large binocular microscope; a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry, General and Applied; Trigonometry; American Authors or French.
2. Chemistry and Laboratory Practice; Conic Sections; British Authors or French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry and Laboratory Practice; Microscopy; German.
3. Agricultural Chemistry and Laboratory Practice; Vegetable Physiology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Work; Mental Science; Meteorology and Physical Geography.
2. Laboratory Work; Constitutional History; Logic.
3. Laboratory Work; Political Economy; Geology.

Students who are candidates for the degree of B. S. in the school of chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

A term of Photography will be provided for students who desire it; it will consist of text-book work, with recitations and daily practice.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It
acquaints the student with the latest researches in respect to the struc-
teaches him to collect and preserve specimens and arrange them for
ture of the earth and to the origin and distribution of its organic products;
study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the Sophomore year, systematic and structural Botany is continued by recitations, illustrated lectures and laboratory work upon fresh, dried, and alcoholic

specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the Laboratory. Each Student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's), and Bessey's Botany are required. For the compound miscroscopes and other apparatus furnished by the University, a deposit of three dollars is required, but no charge is made except for damage and material used. The first half of the term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance, etc., together with a history of a few special plants and their products. During this time, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramineæ, etc., especially such as are best obtained in Autumn. During the last half of the term the general morphology of plants, including vegetable anatomy and histology, is studied, practical laboratory work being the basis of the instruction. Tests are made from time to time by the use of disguised vegetable substances.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied.

The most important books of reference in the English language are Sachs' Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cooke's Fungi and Handbook of British Fungi.

Vegetable Physiology is studied in the third term. The instruction is given by lectures and experimental practice. The work includes:—the food of plants and its absorption and assimilation; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.; processes, peculiarities, and results of growth; relations and effects of temperature, light, gravitation, etc.; self and cross fertilization, relations of plants and insects; movements, "sleep of plants," tendrils, climbing vines, etc.; origin and development.

Throughout the course, the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authorities for the facts stated.

Microscopy and Fungology.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly but not exclusively devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skillful and rational use of the instrument and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn-tables, etc., are furnished by the University.

Anatomy and Physiology.—This subject is presented during the first term of the Junior year. Anatomy is taught by lectures illustrated by skeletons, manikin, models in *papier-mache*, and microscopical preparations. Fresh specimens of various organs are dissected and demonstrated before the class during the term. Physiology is taught by lectures, demonstrations, and recitations from Martin's treatise, The Human Body.

The library contains many of the best books of reference, including works on Anatomy by Gray, Holden, Quain, Ellis, and Morton ; and on Physiology by Flint, Dalton, Kuss, McKendrick, Kirk, Draper, and Marshall.

Zoology is taught during the whole of the Sophomore year from a text-book, and by lectures and practical work in the Laboratory. The text-book used is Packard's. The laboratory work involves the study by dissection of the organs of respiration, circulation, digestion, and locomotion of the higher animals, and of the lower forms as far as may be done with the aid of the microscope.

Geology is taught during the second and third terms of the junior year. LeConte's Geology is used as a text-book. The first term is given to instruction upon the dynamical effects of water in eroding, transporting and depositing materials ; upon the action of heat as manifested in metamorphism, crystalization, consolidation and the production of mountain folds ; upon the nature and material of rocks, veins, dykes, etc., and upon the arrangement and distribution of metals and their ores. The second term is devoted to the consideration of the historic development of the earth as revealed by the study of the animals and plants entombed

therein ; and to a discussion of the elements of time, the system of life, the origin of species, and the antiquity of man.

Osteology and Taxidermy are taught in extra classes.

Physiography, or "the study of nature" is, taught by illustrated lectures during the first term of the Senior year. The subjects considered are the origin of the earth, and its relation to other worlds ; the distribution of land and water; the direction and extent of mountain chains and of ocean currents; the influences which determine the climate of any locality; the systematic distribution of animals and plants; and especially the biological position of man, and his relation to the animate and inanimate worlds around him.

Entomology.—After some introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classifications. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term, lectures are given upon the descriptions of insects, both injurious and beneficial, methods of exterminating, etc., with laboratory work, including naming of species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study.

Students are required to provide themselves with collecting nets and bottles, pins, lined boxes, and books for notes.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blowpipe. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western Plants; a collection of plants from Dr. Vasey, Botanist of the Depart-

ment of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has compound microscopes of four different styles from Europe, two by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands were manufactured in the shops of the University.

Zoology.—The Museum is particularly fortunate in its collections in Zoology, possessing, in mounted specimens or skeletons, nearly all the ruminants of North America, and representatives of all orders of mammals, except Proboscidæ; exhibiting fifty species by eighty mounted specimens, with numerous skeletons. In birds it represents all the families of North America, having two hundred and forty species, represented by over four hundred specimens. Its Articulates number more than three thousand specimens; its fishes, four hundred; its radiates, three hundred, and its reptiles nearly one hundred. Sea, land, and fluviatile shells are represented by seventeen hundred species on deposit. The museum also contains nearly one hundred specimens, representing the osteology of vertebrates; a large collection of the nests and eggs of birds; a collection of Indian implements; and a manikin, a dissected eye, and a trachea, in *papier-mache.*

Geology.—The Geological Cabinet contains Prof. Ward's celebrated college series of casts of famous fossils, including the gigantic megatherium nearly eighteen feet in length; the head of the Elephas Ganesa with tusks ten and a half feet long; the Collossochelys Atlas,—a gigantic tortoise with a shell eight feet by six; and the Plesiosaurus Cramptoni twenty-two and a half feet by twelve and a half feet. It also contains a series of tracks in the sandstone of the Connecticut river; a large collection of carboniferous ferns from the celebrated locality at Morris, Ill.; several thousand specimens of fossils from the State Geological Survey, and from purchase in Europe; and a large number of specimens illustrating building materials, dikes, veins, metamorphism, drift bowlders, etc.

Mineralogy.—The Cabinet of Minerals consists of a valuable and extensive collection of the leads of the State, and accompanying mineral; a collection of models, comprising the most important forms, and combinations in the various systems of crystallization; and a very complete collection of minerals, both American and foreign.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing, (optional); Trigonometry; French.
2. Chemistry; Free-Hand Drawing, (optional); Conic Sections; French.
3. Chemistry or Free-Hand Drawing; Economic Entomology; Rhetoric; French (extra).

SECOND YEAR.

1. Zoology; Botany; German.
2. Zoology; Botany; German.
3. Zoology; Vegetable Physiology; German.

THIRD YEAR.

1. Anatomy and Physiology; Mineralogy; German; Ancient History (optional, extra).
2. Geology; Physics; German; Mediæval History (optional, extra).
3. Geology; Physics; Modern History.

FOURTH YEAR.

1. Physiography; History of Civilization; Mental Science.
2. Microscopy; Constitutional History; Logic.
3. Political Economy; Astronomy; Natural History Laboratory Work.

In this course three terms of University Latin will be accepted in lieu of three terms of French; and five terms of such Latin for five terms of German.

College of Literature & Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean,
PROFESSOR PICKARD,
PROFESSOR SHATTUCK,
PROFESSOR CRAWFORD,

MR. MORSE.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

CANDIDATES for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the school of Ancient Languages will be examined in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody, (Harkness', or Allen and Greenough's); Latin prose composition, (forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 166, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and diphthongs, and pronunciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, writers, and professors, in their special departments, require a knowledge of the ancient, as well as of the modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the arts.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism and other work intended to illustrate the studies pursued, and exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of

practice in, English Composition, should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with a requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over thirteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on page 26.)

SUBJECTS COMMON TO THE SCHOOLS OF THIS COLLEGE.

MATHEMATICS.

First Term:—Trigonometry, plane and spherical; fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; angles as functions of sides and sides as functions of angles; applications.

Second Term:—Conic Sections. Geometrial method. Definitions and general properties of the ellipse, hyperbola, and parabola; curvature of the conic sections.

Analytical Geometry, elements of. Properties and relations of the point and right line in a plane; of the conic sections.

Third Term:—Advanced Geometry; Modern Geometry. Harmonic proportion and harmonic pencils; anharmonic ratio and involution; poles and polars in relation to a circle; the radial axes and centers of similitude of two circles; the principle of continuity; elementary principles of projection.

Text Books—Coffin's Conic Sections and Analytical Geometry; Mulcahy's Modern Geometry.

PHYSICS AND ASTRONOMY.

For these subjects, see College of Engineering.

NATURAL SCIENCES.

See College of Natural Science.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the Junior and Senior years of the University Course.

JUNIOR YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; General European History; European Geography.

SENIOR YEAR.

Constitutionial History of England and the United States; History of Civilization, Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers and are therefore confined to the Senior year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful conditions of thought, growth and decay of mental and moral powers. Philosophy of education, theory of conscience; nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and in the formation of the habits of thinking and common judgments of life.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of The School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical languages. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read the entire works of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English ; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German: to Philology; to the Philosophy of English Literature, and to Esthetics. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage in linguistic culture is gained by the student. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition, and conversation.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia; French; Trigonometry.
2. British Authors or Livy; French; Conic Sections.
3. Rhetoric; French; Advanced Geometry, or Free-Hand Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology, or Botany.
2. English Classics; German; Zoology, or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History.
2. German; Physics; Mediæval History.
3. German; Physics or Chemistry; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. Early English; Constitutional History; Logic.
3. Philology; Political Economy; Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in Ancient languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of

the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year ancient history is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for the students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

COURSE IN SCHOOL OF ANCIENT LANGUAGES,

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition, Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Odyssey and prose composition; Conic Sections.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Advanced Geometry.

SECOND YEAR.

1. Satires of Horace; Thucydides or German; Physiology.
2. Terence; Sophocles or German; Zoology.
3. Tacitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. Mental Science; History of Civilization; Physiography.
2. Logic; Constitutional History; Early English.
3. Political Economy; Philology; Geology.

Additional Schools.

Not Included in the Four Colleges.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR WM. T. WOOD.,*

2ND LIEUT. 18TH INFANTRY, U. S. A.

BY the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the college classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc.
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties; Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is now under the charge of Lieut. Wm. T. Wood, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

*Lieut. Wood's detail will expire July 1st, and the place will be filled by LIEUT. CHARLES MCCLURE, 18th Infantry, U. S. A.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other courses of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as captains in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorially an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science; Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall with winter terms under careful leaders. Fee 50 cents.

The University Cornet Band is composed of students who while members of the band are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

3. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signalling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signalling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

SCHOOL OF ART AND DESIGN.

Professor Peter Roos.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufacturers, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

Students not seeking a professional training may yet avail themselves of the two years' course in industrial art. Any person of ordinary ability who faithfully completes this course will be qualified to teach drawing and designing in the public schools, or to enter professions with great advantage in the various branches of industry, where artistic skill and taste are indispensible to success.

FIRST TERM.

(Exercises in Outline.)

Elements of Form; Analysis of Compound Forms; Elementary Designs; Elementary Perspective by aid of objects; Elements of Historic Ornaments; Memory Exercises.

SECOND TERM.

Enlargement and Shading from copy; Ornamental designs from plant form; Naturalistic and Conventional Arrangement; Harmonious Lines and Distribution of Form; Perspective Drawing of Objects, Plants, etc.; Features of the Human Head; History of Early Art.

THIRD TERM.

Outline Drawing and Shading from Casts of Ornament; Application of Decorative Forms to flat and round surfaces under various conditions; Designs for Specified Objects; Advanced Perspective and Shadows; Harmony and Contrast of Color, (Lectures on Art and its History).

FOURTH TERM.

(Clay and Wax Modeling)

Basso Relievo Ornament from the Solid; Features and the Human Head from description; Relievo Ornament from shaded copies or drawings; Original Designs for Decorative purposes; Enlargements and Reduction from casts; History of Styles of Ornament.

FIFTH TERM.

Shading from Statuary Casts, etc.; Drawing of Landscape and Animals from copy in Charcoal and Sepia; Color applied to Decorative Art; Designs for useful Objects; Perspective drawings of interior of Rooms.

SIXTH TERM.

General review of the principal work done; Specimen plates to be completed; Optical and Physical principles of color in nature; Aerial Perspective; Sketching from Nature in Charcoal and Color; Artistic Anatomy of Form and Proportion, by illustrated lectures; Famous Artists and their principal works.

Students having passed satisfactorily in the above course will be permitted to enter the advanced classes.

The following course is for those who wish to become accomplished either as designers, painters, or teachers. In order that the student may acquire thoroughness in the branch he wishes to pursue as a speciality, the subject has at this stage been formed into two divisions, decorative and pictorial. The teacher student must give attention to both branches, and with him theory will necessarily supersede practice. Opportunities will be afforded such pupils to teach in the elementary classes whereby greater efficiency will be acquired.

SPECIAL COURSE IN PAINTING.

Trees, Animals, and Figures from copy and from nature in Pencil, Charcoal, and Sepia; Aerial Perspective.

Anatomy of Expression; External muscular development; Shading from Statuary in Charcoal and Monochrome; Composition drawing from description; Memory Exercises.

Water Color Painting from pictures; Sketching from Nature in Sepia and Water Colors; Copying from Oil Paintings of Portraits and Landscapes.

Sketching from nature in Oil Colors; Rapid studies of interiors with varied arrangement of light and shade; Pictorial composition introducing figures or animals; Theory and History of Art.

Portrait Painting from life; Pictures finished from sketches; Studying of Groups of Still Life Subjects; Painting of ideal composition of one or more heads; Chemistry of color.

ADVANCED COURSE IN DESIGNING.

Studies in Clay or Wax.

Ornaments and Plant form in Basso Relievo from flat examples; Designs adaptive to useful objects; The Human Figure from cast or original composition, reproduced by casting in metal or plaster; Processes of manufacture; Monumental designs.

Shading from cast and from nature; Classic objects and furniture enlarged from copy; Designs finished with Pen, Brush, and Distempera color; Architectural construction.

Design for Church Decoration in Historic Styles; Memorial Windows for stained glass: Decorative designs; Commemorating events in History; History of manufactures and important inventions.

ADVANCED TEACHERS' COURSE.

A teacher must be prepared for emergencies for which the professional designer or artist has no experience. A general knowledge of the several subjects is therefore recommended. The decorative and painting courses will be worked together so as to form a thorough course for teachers.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvernay's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudes de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740, Books, 1, 2, 3; Cramer's Studies, Books, 1, 2. 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction term of ten weeks—2 lessons a week	$10.00
For term of ten weeks—one lesson a week	6.00
Practice on piano, one hour daily, per term	2.00

MRS. ABBIE WILKINSON,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents. The studies taught in the preliminary year are as follows:

PREPARATORY STUDIES.

For the Colleges of Agriculture, Engineering, and Natural Science.

First Term.—Algebra—(Newcomb's) Fundamental rules, Factoring, Common Divisors and Multiples, Powers and Roots, Calcalus of Radicals, Simple Equations, Proportion and Progression. *Physiology*—(Dalton's or an equivalent.) *Natural Philosophy*—(Norton's or an equivalent.)

Second Term.—Algebra.—Quadratic equations, etc *.Geometry.*—(Chauvenet's) Plane Geometry, Lines, Circumferences, Angles, Polygons, ås far as equality. *English.*—Elements of Composition. (Gilmore's Art of Expression or equivalent.) Orthoepy and Word Analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed, including solid Geometry and the Sphere. *English* as in the second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin.*—Cicero's Orations. *Greek*, Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin*, Virgil.

Third Term.—Geometry completed. *Latin*, Virgil's Æneid. *Greek*, The Anabasis.

Greek, Xenophon's Anabasis.

N. B.—Greek is required only for the School of Ancient Languages. The School of English and Modern Languages requires Physiology, Natural Philosophy, and Botany instead of Greek.

Students in the preparatory studies are not matriculated as University students. They pay no entrance fee, but are charged a tuition fee of

five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library and of the public lectures.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	Chas. Raymond,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	J. N. Wilkinson,	"
Champaign, East High School	I. L. Betzer,	"
Urbana High School	J. W. Hays,	"
Oak Park High School	B. L. Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	H. H. Belfield,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park High School	Leslie Lewis, Supt	
Marengo High School	C. J. Allen,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High School	John T. Hall,	"
Springfield High School	F. R. Feitshans, Supt.	
Monticello High School	G. A. Burgess.	"

Warren High School	D. E. Garver,	Principal.
Peru High School	Joseph Carter,	"
Peoria High School	Charles A. Smith,	"
Galena High School	R. L. Barton,	"
Shelbyville High School	J. F. Goudy,	"
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	P. R. Walker,	"
Rossville High School	W. A. Chamberlain,	"
Bement High School	W. E. Mann,	"
Oakland High School	Charles I. Parker,	"
Jacksonville High School	D. H. Harris, Supt.	
Danville High School	S. Y. Gillan,	"
Marshall High School	L. S. Kilborn,	"
Charleston High School	E. J. Hoenshel.	"
Tuscola High School	F. A. E. Starr,	"
Streator High School	R. A. Haste,	"
Ottawa High School	H. L. Boltwood,	"

EXAMINING SCHOOLS.

The Trustees have authorized the Faculty to designate one or more High Schools in each county of the State, of sufficiently high grade and good reputation, whose certificates of examination, in the branches required of candidates for the University, may be received in lieu of the usual examination of the University.

These must be Graded, or High Schools of good reputation, and of sufficiently extended course to prepare students for the University. The principal teachers of the schools selected will be authorized to prepare questions and conduct examinations if any of their students are desirous of entering the University, but the papers must be sent to the University for final decision.

EXAMINING SCHOOLS.

Rockford West High School	W. W. Stetson,	Principal.
Sterling, 2d Ward High School	Alfred Bayliss,	"
Belvidere High School	H. J. Sherrill,	"
Lanark High School	F. T. Oldt,	"
Belleville High School	Emil Dapprich,	"
Dwight High School	Jesse Hubbard,	"
Macomb High School	George Blount,	"
Rantoul High School	N. J. Betzer,	"
Kewanee High School	E. C. Rossiter,	"
Arcola High School	T. C. Clendenin,	"

UNIVERSITY DISCOURSES.

During the year a series of discourses has been delivered in the University Chapel on Sunday afternoons, by distinguished clergymen of various denominations, as follows:

Oct. 15. REV. H. McD. SCOTT,
SUBJECT; Christ the Carpenter.

Nov. 5. RT. REV. GEORGE F. SEYMOUR, S. T. D.,
SUBJECT; The Bible Portrait of the First Christians.

Nov. 26. REV. H. D. JENKINS, D. D.,
SUBJECT; Sobermindedness.

Dec. 17. REV. L. P. MERCER,
SUBJECT; The Christian Life.

Jan. 21. REV. GEORGE BATCHELOR,
SUBJECT; Charity.

Feb. 11. REV. J. H. BARROWS, D. D.,
SUBJECT; Man's Need of God.

March 4. RT. REV. CHARLES EDWARD CHENEY, D. D.,
SUBJECT; Does Christianity Cultivate Manliness.

March 25. REV. T. M. POST, D. D.,
SUBJECT; Thinking.

April 14. REV. P. S. HENSON, D. D.,
SUBJECT; Christianity and Common Sense.

May 6. RT. REV. JOHN F. HURST, D. D.,
SUBJECT; The Incalculable Importance of Little Things.

The expenses of this course have been generously defrayed by MR. ELIPHALET W. BLATCHFORD, of Chicago.

Mr. ALBERT C. BURNHAM, of Champaign, has kindly promised to provide for a similar course of sermons during the coming year.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as President of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The degree of Bachelor of Letters, B. L., will be given to those who complete the course in the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course in the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued, and passed examinations on, a year of prescribed post-graduate studies, or after a term of successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding houses in Urbana or Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2.00 per week. Some students prepare their their own meals, and thus reduce expenses still farther.

For estimates of annual expenses see page 82.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their preficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor is *ten cents,* and for that about the buildings and ornamental grounds, *eight cents per hour.* Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry and economy,* pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

STUDENT'S GOVERNMENT.

For several years an experiment has been in progress, in the self-government of the students of the University. By permission of the Faculty, the General Assembly of the students was organized, and a constitution adopted providing for the election of a President, Vice-President, Secretary, and Marshal; for a Senate of twenty-one members, and a court consisting of a Chief Justice and two Associate Judges. Under this constitution, laws are enacted by the Senate, which become valid only when approved by the Regent and Faculty of the University. All offenses against these laws are tried before the student's court, and punished by fines according to the class of the offense. Students refusing to pay the fines imposed by the student's government, are referred to the Faculty, and if found guilty of an offense, are sentenced to such penalties as the Faculty may deem proper. The government has thus far rendered important aid in maintaining good order in the dormitories and

grounds, in preserving public property, in preventing the visiting of saloons, and in other matters requiring the intervention of authority, and above all, in cultivating kindly relations between the Students and Faculty, and a spirit of manliness and self-control.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed:

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 28 and 29.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College. (See page 76.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount...$10.00

THE TERM FEE for Incidental Expenses is, for each student........... 7.50

Room Rent in University Dormitory, each student per term, $2.00 to 6.00

Each student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $8, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are the estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University.

	MIN.	MAX.
Term Fees and Room Rent for each Student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing, at 75 cents per dozen	13.50	27.00
Total Annual Amount	$124.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$5.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students	10 00
Graduating Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money*, without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

Calendar for 1883-84.

Examinations for Admission	Monday,	September 10
First or Fall Term begins	Wednesday,	September 12
First Term ends	Wednesday,	December 19

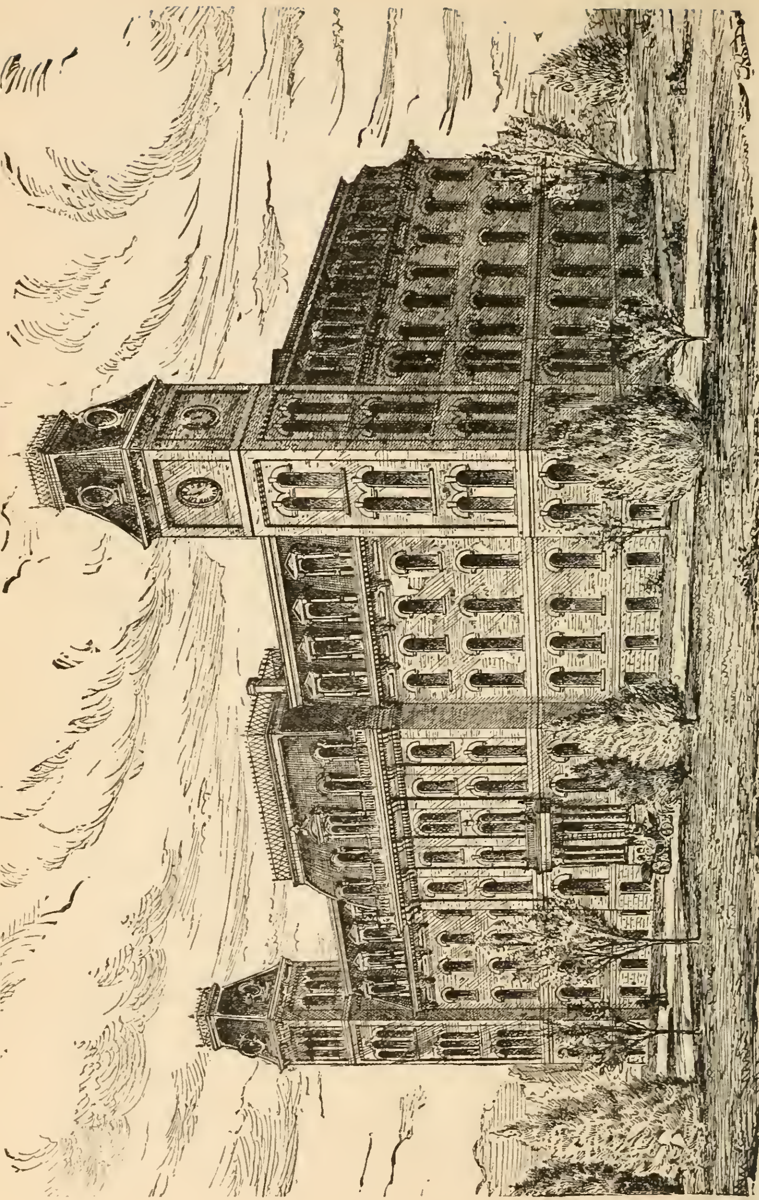
WINTER VACATION.

FOR 1884.

Examination for Admission to Advanced Classes	Tuesday,	January 8
Opening of the Second or Winter Term	Wednesday,	January 9
Anniversary Day		March 11
Second Term ends	Wednesday,	March 26
Third or Spring Term begins	Wednesday,	March 26
Baccalaureate Address in University Chapel	Sunday,	June 8
Class Day	Monday,	June 9
Alumni Day	Tuesday,	June 10
Commencement	Wednesday	June 11

SUMMER VACATION.

Examinations for Admission	Monday,	September 15
First or Fall Term begins	Wednesday,	September 16



LEARNING AND LABOR.

Catalogue and Circular

OF THE

Illinois Industrial University,

Urbana, Champaign County, Ill.

1883-84.

CHAMPAIGN:
GAZETTE STEAM PRINT.
1884


STATE
SOVEREICNTY.
NATIONAL
UNION

Board of Trustees.

Faculty.

SELIM H. PEABODY, Ph. D., LL. D.,
REGENT, and Professor of Mechanical Engineering and Physics.

THOMAS J. BURRILL, M. A., Ph. D.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

GEORGE E. MORROW, M. A.,
Professor of Agriculture.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

PETER ROOS,

Professor of Industrial Art and Designing.

IRA O. BAKER.

Professor of Civil Engineering.

WILLIAM McMURTRIE, E. M., Ph. D.,

Professor of Chemistry.

BENJAMIN C. JILLSON, M. D., Ph. D.,

Professor of Geology and Zoology.

CHARLES McCLURE,

SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

JEROME SONDERICKER, B. S.,

Assistant Professor of Engineering and Mathematics.

CHARLES W. ROLFE, M. S.,

Assistant Professor of Natural History.

ARTHUR T. WOODS,

ASSISTANT ENGINEER, U. S. N.,
Assistant Professor of Mechanical Engineering.

EDWIN A. KIMBALL,

Instructor in Iron-work, and Foreman.

GEORGE W. PARKER,

Instructor in Wood-work, and Foreman.

EMMA M. HALL, M. A.,
Instructor in Ancient Languages.

MARY E. DARROW, B. A.,
Instructor in Modern Languages.

MRS. ABBIE WILKINSON,
Teacher of Vocal and Instrumental Music.

WILLIAM A. WETZEL,
Teacher of Elocution.

ARTHUR W. PALMER, B. S.,
First Assistant in Chemical Laboratory.

FRED W. EBERLEIN,
Second Assistant in Chemical Laboratory.

A. B. BAKER,
Janitor.

List of Students.

Resident Graduates.

NAME.	RESIDENCE.
Lewis, Ralph D.	Champaign.
Palmer, Arthur W., B. S.	Springfield.
Taft, Lorado, M. L.,	Champaign.

Senior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbot, William L	Mechanical Engineering	Union Grove.
Austin, James	Civil Engineering	Altona.
Babcock, Guy H	Agriculture and Military	Ridott.
Barber, Henry H	Civil Engineering	Savanna.
Bartholf, Emmet G	Ancient Languages	Plainfield
Bartholf, William J	Ancient Languages	Plainfield.
Braucher, Arthur C	Civil Engineering	Lincoln.
Chapman, Norman W	Civil Engineering	Gerlaw.
*Cole, T Edward	Elective	Champaign.
*Davis, James O	Civil Engineering and Mil.	French Grove.
*Dunlap, Robert L	Chemistry	Savoy.
Eberlein, Frederic W	Chemistry	Mascoutah.
Herdman, Frank E	Mechanical Eng. and Mil.	Zanesville, Ohio.
Hunt, Thomas F	Agriculture	Ridott.

NAME.	COURSE.	RESIDENCE.
Kimball, Edwin R	Chemistry and Military	Champaign.
Lietze, Frederic A	Civil Engineering	Carlyle.
Lilly, Charles H	Chemistry	Champaign.
Lilly, James E	Ancient Languages	Champaign.
McCluer, George W	Agriculture	Farina.
*Marshall, Sherman L	Lit. and Science and Mil.	Ipava.
Montezuma, Charles	Chemistry	Chicago
Morgan, George N	Literature and Science	Kinmundy.
*Morse, E. Leland	Civil Engineering and Mil.	Cazenovia.
*North, Arthur T	Architecture	Kewanee.
North. Foster	Natural History	Kewanee
Parr. Samuel W	Chemistry	Gibson City.
Philbrick. Solon	Lit. and Science and Mil.	Baileyville.
Roberts, Lewis C	Elective and Military	Jefferson.
*Roberts, Vertus B	Civil Engineering and Mil.	Joliet.
Rupp, Andrew O	Literature and Science	Chenoa.
*Sherrill. Frank A	Civil Engineering	Belvidere.
Sizer, Lucius N	Civil Engineering and Mil.	Mahomet.
Speidel, Ernst	Chemistry	Rock Island.
Stevens, Hubert A	Civil Engineering	Chicago.
Stratton, Samuel W	Mech. Eng. and Military	Litchfield.
Van Petten, Henry S	Chemistry	Chillicothe.
Vial, Edmund R	Agriculture	Western Springs.
Wills. Jerome G	Literature and Science	Vandalia.
*Woodworth, Chas W	Chemistry	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayers, Nettie	Literature and Science	Urbana.
Barber, Ella U	Literature and Science	Champaign.
Braucher, Alma E	Natural History	Lincoln.
Campbell, Juniata G	Literature and Science	Polo.
Clark, Lucy J	Ancient Languages	Champaign.
Conkling, Anna J	Literature and Science	Champaign.
Ellis, Lola D	Literature and Science	Canton.
Hall, Lucy A	Literature and Science	Champaign.
Hill, Cora J	Literature and Science	Champaign.
Kimball, Georgetta	Literature and Science	Champaign.
*Krause, Josephine	Literature and Science	Chicago.
Sim, Kitturah E	Literature and Science	Urbana.
Smith, Laura B	Literature and Science	Champaign.

Junior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
*Allen, E Wright	Agriculture	Harristown.
Ayers, Judson F	Literature and Science	Urbana.
*Barrett, Dwight H	Chemistry	La Moille.
*Carter, Harry L	Mechanical Engineering	Humboldt.
Colton, Samuel K	Architecture	Chicago.
Colton, Simeon C	Civil Engineering	Chicago.
Ellis, George H	Chemistry	Milwaukee, Wis.
Hicks, George L	Literature and Science	Warren.
Hopper, Charles S	Literature and Science	Bristol.
*Kendall, William F	Civil Engineering	Rock Island.
Kent, James M	Mechanical Engineering	Kewanee.
Lantz, Milo P	Natural History and Mil.	Oak Grove.
Lattin, Judson	Mech. Eng. and Military	Sycamore.
*Manns, Albert G	Chemistry	Chicago.
Miller, John A	Chemistry	Buffalo, N. Y.
*Odell, Arthur M	Civil Engineering	East Dubuque.
*Parker, William H	Literature and Science	Oswego
Peterson, Harry G	Civil Engineering	Champaign.
Petty, George R	Civil Engineering	Pittsfield.
*Rankin, Charles H	Civil Engineering	Fall Creek.
Reynolds, Henry L	Mechanical Engineering	Camp Point.
Ronalds, Hugh L	Mechanical Engineering	Grayville.
Schleder, Theodore H	Architecture	Greenvale.
Schrader, Alfred C	Civil Engineering	Chicago.
*Scott, John A	Elective	Champaign.
*Smith, William H	Literature and Science	Salem.
Stockham, Wm H	Mech. Eng. and Military	Chicago.
Swern, William C	Architecture	Marshall.
Vial, Fred K	Agriculture	Western Springs.
*Wilmot, Frank L	Chemistry	Lawn Ridge.
Wright, John E	Literature and Science	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Clark, Kate F	Natural History	Cobden.
Earle, Mary T	Natural History	Cobden.
Jones, Emma T	Literature and Science	Champaign.
*Merboth, Louisa	Literature and Science	Spring Bay.

NAME.	COURSE.	RESIDENCE.
Owens, Bessie W	Literature and Science	Urbana.
*Plank, Besse G	Literature and Science	Champaign.
Reed, E May	Literature and Science	Frankfort, Kans.
*Switzer, Charlotte	Literature and Science	Champaign.
Weston, Abbie	Literature and Science	Champaign.
*Wills, Etta C	Elective	Vandalia.
*Wright, Lizzie M	Literature and Science	Champaign.
Wright, Minnie S	Literature and Science	Plainfield.
*Zeller, Josephine M	Elective	Spring Bay.

Sophomore Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Alfred N	Agriculture and Military	Union Grove.
*Allen, Aleck M	Architecture	Champaign.
*Ashby, William M	Literature and Science	Champaign.
Babcock, William A	Literature and Science	Ipava.
Bannister George S	Architecture	Odell.
Bassett, Owen B	Agriculture	Dana.
Bishop, John F	Architecture	Champaign.
Brown, Simon	Civil Engineering	Grant Fork.
*Bullard, S Foster	Architecture	Mechanicsburg.
Chitty, William L	Literature and Science	Metamora.
Clark, Arthur S	Architecture and Military	Champaign.
*Conkey, Carl A	Agriculture	Homer.
Cromwell, John C	Mechanical Engineering	Frankfort, Ky.
Dodds, Joseph C	Literature and Science	Sadorus.
*Earle, Charles T	Chemistry	Cobden.
Endsley, Lee	Literature and Science	Milford.
Fulton, James	Civil Engineering	Eureka.
Garrett, James H	Mechanical Engineering	Ashton.
*Gill, Rudolph Z	Architecture	Urbana.
Greeley, George H	Mechanical Engineering	Waterman.
*Hankins, Walter A	Architecture	Argenta.
Harris, James W	Civil Engineering	Blackberry.
*Herrington, Dext. E	Mechanical Engineering	Greenwood.
Hubbard, Harry T	Literature and Science	Urbana.
*Hull, Lucius M	Elective	Godfrey.

NAME.	COURSE.	RESIDENCE.
*Hutchinson, Wm H	Literature and Science	Rantoul.
Jones, John W	Mechanical Engineering	Bodega, Cal.
Latham, Ector B	Civil Engineering and Mil.	Atlanta, Ga.
Lumley, Clinton G	Literature and Science	Ringwood.
*McGregor, Wm. G	Mechanical Engineering	Chicago.
Mackay, John L	Mech. Eng. and Military	Mt. Carroll.
Marquiss, John A	Natural History and Mil.	Monticello.
Mathers, George B	Civil Engineering	Mason City.
Maxwell, William W	Literature and Science	Champaign.
Millar, W Edwin	Civil Engineering	Mattoon.
Morse, Henry M	Mechanical Engineering	Cazenovia.
Olshausen, Walt. A G	Civil Engineering	Davenport, Ia.
*Paxton, Charles M	Agriculture	Kansas.
Pearman, Ira E	Literature and Science	Champaign.
Pease, James F	Agriculture	Quincy.
Philbrick, Alvah	Civil Engineering and Mil.	Baileyville.
*Plowman, William L	Literature and Science	Virden.
Robison, Elmer C	Agriculture	Tremont
Samson, John F	Chemistry	Sidney.
Shlaudeman, Harry	Architecture	Decatur.
*Sickels, F Henry	Literature and Science	Champaign.
Speidel, Hugo	Civil Eng. and Military	Rock Island.
Taylor, John F	Civil Engineering	Taylor.
Wilder, Henry W	Anc. Languages and Mil.	Champaign.
Whitmire, Z Lincoln	Literature and Science	Metamora.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayers, L Belle	Literature and Science	Urbana.
Cumberland, Hattie	Literature and Science	Champaign.
Elder, Nettie	Literature and Science	Urbana.
Ermentrout, A. Mae	Literature and Science	Urbana.
Fairchild, Rozina P	Literature and Science	Metamora.
Huff, Bertie	Literature and Science	Champaign.
Jaques, Minnie	Literature and Science	Urbana.
*Lilly, Fannie	Literature and Science	Champaign.
McClain, Mary E	Literature and Science	Urbana.
*Oliver, Bertha R	Literature and Science	La Salle.
Parminter, Grace E	Literature and Science	Metamora.
Paullin, L Estelle	Literature and Science	Atlanta.

Freshman Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bacon, George F	Civil Engineering	Champaign.
Barclay, William	Civil Engineering	East Wheatland.
Blake, John B	Mech. Eng. and Military	Lombard.
*Caldwell, Frank W	Chemistry	Cisco.
Cannady, Stephen D	Chemistry	Logan, Mo
Cantine, Edward I	Civil Engineering and Mil.	Bloomington.
Connett. Oliver	Civil Engineering and Mil.	Champaign.
Cope, Walter L	Agriculture	Salem.
Courtney, Louis	Civil Engineering	Milford.
Clark, Percy L	Chemistry and Military	Elgin
Dickinson, Frank H	Literature and Science	Danvers.
Doan. Edward G	Mechanical Engineering	Champaign.
Evarts, John I	Chemistry	Yorkville.
Everhart, T W B	Ancient Languages	Champaign.
Fargusson, Mark	Civil Engineering and Mil.	Chicago
*Flickinger, Fred C	Elective and Military	Winthrop, Iowa.
*Gaines, James E	Mechanical Engineering	Middletown.
Gilbert, Frank M	Mechanical Engineering	Bryan, Texas.
Goodwin, Phil. A	Civil Engineering and Mil.	Wilmington.
Grubb, Edwin S	Literature and Science	Springfield.
*Hazard, Henry B	Civil Engineering	Chicago
Hill, Walter A	Mech. Eng. and Military	Champaign.
*Howard, Charles P	Mechanical Engineering	Champaign.
Jacobson, Jacob S	Civil Engineering	Chicago.
Johnson. Edward S	Civil Engineering and Mil.	Milan.
Jones, William D	Natural History	Pawnee.
*Krout, George	Civil Engineering	Oakley.
Lemme, Emil	Architecture	Davenport, Iowa.
Leonard, John B	Civil Engineering	Union City, Mich.
Lloyde, Clarence A	Mech. Eng. and Military	Champaign.
*Long, Frank B	Architecture	Virden.
Lyman, Henry M	Mech. Eng. and Military	Lemont.
Miller, Harry R	Literature and Science	Champaign.
Moffett, Ocea E	Literature and Science	Modesto.
Moore, Albert C	Lit. and Science and Mil.	Polo.
Peabody, Lorin W	Mechanical Engineering	St. Joseph.
Pence William D	Civil Engineering and Mil.	Columbus, Ind.
Powers, Mark	Natural History	Fayetteville, Mo.

NAME.	COURSE.	RESIDENCE.
Prunk, Frank H	Mechanical Engineering	Indianapolis, Ind.
*Ryan, Edgar	Civil Engineering	Virden.
Sargent, Charles E	Mechanical Engineering	Carlinville.
*Spear, Grant W	Mechanical Engineering	Aurora.
Spencer, James E	Mech. Eng. and Military	Urbana.
Squire, Willis C	Mechanical Engineering	La Grange.
*Stewart, Walter	Chemistry	Wilmington.
*Strout, Edward L	Mechanical Engineering	Wilton Center.
Taylor, Horace	Elective	Nokomis.
Thompson, Luther	Civil Engineering and Mil.	Bement.
Tunnell, Frank W	Chemistry and Military	Edwardsville.
Waite, Merton	Natural History and Mil.	Oregon.
*Webster, Adelb'rt W	Literature and Science	Poplar Grove.
*Willard, Reuel	Mechanical Engineering	Wilmington.
Williams, Herbert B	Mining Engineering	Farm Ridge.
Wright, William B	Natural History and Mil.	Connersville, Ind.
*Young, Robert L.	Arcl itecture	Indianapolis, Ind.

LADIES.

NAME.	COURSE.	RESIDENCE.
Burr, Frances C	Literature and Science	Philo.
Detmers, Frederica	Natural History	Champaign.
Eichberg Emma	Literature and Science	Champaign.
Elder, Mantie	Literature and Science	Urbana.
Gayman, Angelina	Literature and Science	Champaign.
*Gilkerson, Ida M	Literature and Science	Marengo
*Jutkins, Charlotte R	Literature and Science	Savoy.
Kimball, C Maud	Elective	Champaign.
Mathers. Effie	Natural History	Mason City.
*Oliver Florence M	Literature and Science	La Salle.
Paxton, Lillian	Elective	Kansas.
Price, Grace M	Literature and Science	Champaign.
Price, Kate C	Literature and Science	Champaign.
Terbush, Jennie M	Literature and Science	Champaign.
Williamson, Mary H	Literature and Science	Urbana.
Zeller, Frederica C	Literature and Science	Spring Bay.

Preparatory Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Arnold, Jay B		Chicago.
Bell, George A	Mechanical Engineering	Cobden.
Bing, Benjamin	Chemistry	Urbana.
Blish, Frank M	Literature and Science	Wilmington.
Block, Benjamin	Mechanical Engineering	Rock Island.
Bowsher, Columbus A	Civil Engineering	Barnett.
Broeker, William	Mechanical Engineering	Springfield.
Bunn, Frank W	Mechanical Engineering	Sterling.
Butler, Frank E	Agriculture	Elgin.
Butler, Lawrence P	Mechanical Engineering	Rock Island.
Castle, John E		Ridge Farms.
Clark, Russell S		Mattoon.
Crum, Oscar M		Virginia.
Crum, William S	Literature and Science	Virginia.
Davis, William	Architecture	French Grove.
Dose, Henry	Civil Engineering	New Athens.
Drake, Fred B	Architecture	Cavour, Dakota.
Dryer, Ervin	Mechanical Engineering	Champaign.
Ellison, Edward	Civil Engineering	Marine.
Ellmore, Oscar		Mason City.
England, Charles E		Monticello.
Eppstein, Louis B	Civil Engineering	Denison, Texas.
Fink, Bruce	Natural History	Aurora.
Fisher, J George	Mechanical Engineering	Oregon.
Foster, Benjamin L		Bradford.
Gaskill, Beattie E	Chemistry	Mascoutah.
Getzo, Elmer	Civil Engineering	Adams.
Goldschmidt, A G	Mechanical Engineering	Davenport, Iowa.
Goldschmidt, E W	Mechanical Engineering	Davenport, Iowa.
Gordon, Joseph J	Ancient Languages	Cairo.
Graham, William	Elective	Oquawka.
Griffith, Walter G		Clear Creek.
Hadra, Fritz		San Antonio, Tex.
Hanson, Emerson	Natural History	Bardolph.
Holston, Edward E	Architecture	Nashville.
Holt, Luther	Elective	Foxville.
Hoyt, Charles M		Aurora.
Jutkins, Leonard F	Agriculture	Savoy

NAME.	COURSE.	RESIDENCE.
Krause, Herman E		Chicago.
Lester, Ballard P	Agriculture	Penfield.
Livingston, Wm H	Literature and Science	Ash Grove, Mo.
McFerson, Grant		Tonica.
McGaric, Fred O		Keokuk, Iowa.
Mackay, Duncan F	Natural History	Mt. Carroll.
Magee, Elmer E		Ellsville.
Marshall, X S	Chemistry	Centralia.
Meneley, Charles W	Literature and Science	Champaign.
Miles, William E		Kewanee.
Miller, James M	Literature and Science	Champaign.
Mitchell. Walter R	Natural History	Bement.
Morse, Hiram B	Natural History	Warrensburg.
Napper, S T	Agriculture	Scales Mound.
Noble, John		Todd's Point.
Norris, Isaac H	Civil Engineering	Arlington.
Parker, Orson S		Oswego.
Pease, Chester I		Marion.
Pickard, Edward W	Ancient Languages	Urbana.
Piper, Charles W	Mechanical Engineering	Chicago
Piper, Edward D	Civil Engineering	Chicago.
Place, Raymond M	Literature and Science	Atlanta.
Powel, John F	Civil Engineering	Jerseyville.
Reese, George J	Civil Engineering	Sidney.
Renner, Enos H	Literature and Science	Champaign.
Scott, Archie R	Literature and Science	Champaign.
Shriver, Alonzo L	Mechanical Engineering	Champaign.
Shumway, Horatio G	Mechanical Engineering	Batavia.
Simons, Burton R		Oswego.
Sims, Charles		St. Joseph.
Tatarian, Bedros	Chemistry	Constantinople, Turkey.
Taylor, George F	Literature and Science	Watson.
Tossey, Francis J	Literature and Science	Toledo.
Troyer, William L	Agriculture	Dorchester.
Vanderhoof, B	Agriculture	Newton.
Walsh, John W	Literature and Science	LaSalle.
Weeks, George H	Mining Engineering	Chicago.
Young, William F		Oswego.

LADIES.

NAME.	COURSE.	RESIDENCE.
Eisenmayer, Ida	Literature and Science	Mascoutah.
Eldridge, Mary A	Literature and Science	Galva.
Jillson, Nellie W	Literature and Science	Champaign.
Jillson, Sallie R	Literature and Science	Champaign.
Lane, Nannie P	Literature and Science	Mattoon.
McLellan, Mary C	Literature and Science	Champaign.
Neely, Kate	Literature and Science	DuQuoin.
Shepherd, Jessie A	Literature and Science	Hennepin.
Sim, Mary Etta	Literature and Science	Urbana.

Special Students.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Baur, George	Agriculture	Winterset, Iowa.
Berlin, Sven N	Architecture	Brimfield.
Blanchard, Herbert J	Architecture	Kewanee.
Carpenter, T S	Agriculture	Na-au-say.
Cornelius, Charles	Agriculture	Halle, Germany.
Jobst, Bernhard	Architecture	Peoria.
Sexton, Charles E	Agriculture	Kendall.

LADIES.

NAME.	COURSE.	RESIDENCE.
Field, Ella	Art and Design	Champaign.
Heath, Ella	Art and Design	Champaign.
Hill, Addie M	Art and Design	Champaign.
Jillson, Lizzie S	Art and Design	Champaign.
Price, Mary H	Art and Design	Champaign.
Ream, Wynne	Art and Design	Lincoln.

Summary.

BY CLASSES.	GENTLEMEN.	LADIES.	TOTAL.
Resident Graduates	3		3
Seniors	39	13	52
Juniors	31	13	44
Sophomores	50	12	62
Freshmen	55	16	71
Preparatory	76	9	85
Special	7	6	13
Total	261	69	330

BY COURSES.	GENTLEMEN.	LADIES.	TOTAL.
Agriculture	24		24
Mechanical Engineering	45		45
Civil Engineering	51		51
Mining Engineering	2		2
Architecture	21		21
Chemistry	26		26
Natural History	12	5	17
Art and Design		6	6
English and Modern Languages	41	53	94
Ancient Languages	7	1	8
Elective	8	4	12
Not Specified	21		21
	258	69	327
Resident Graduates	3		3
Total	261	69	330

Illinois Industrial University.

HISTORY.

THE Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and mounting in this State to 480,000 acres. The University was chartered n February, 1867, and opened to students in March, 1868. In addition o the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also has nade large appropriations for fitting up and stocking the farms, for ibrary and apparatus, and for buildings, including the large Main building erected in 1872 and 1873, the Mechanical Building and Drill Hall, nd the Chemical Laboratory. Successive Colleges and schools have been dded as required, until four Colleges, including ten distinct Schools, ave been organized.

The whole number matriculated as students since the opening is 1,831. The number graduated from the several Colleges, including the class of 883, is 369. In 1871 the University was opened for lady students, on the ame terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition t Philadelphia, three diplomas and a medal. In 1877 its exhibit at the Paris International Exposition gained a diploma and the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles outh from Chicago, at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The county is a egion of beautiful rolling prairies, with large belts of timber along the treams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house.

The Main University Building, designed wholly for public uses, occupies three sides of a quadrangle, the frontrage being 214 feet and upon the wings 122 feet. The Library wing is fire-proof, and contains in spacious halls the Museum of Natural History, the Library, the Art Gallery, and the Museum of Engineering. The Chapel wing contains the Chapel, the Physical Laboratory and Lecture Room, and rooms for draughting and drawing. In the main front are convenient class-rooms; on the upper floor, elegant halls for literary societies. The building is warmed by steam from a boiler-house which forms the fourth side of the quadrangle in the rear.

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler-room, a machine shop, furnished for practical use with a steam engine, lathes, and other machinery ; pattern and finishing shop ; shops for carpentry and cabinet-work, furnished with wood-working machinery; paint and draughting rooms, and rooms for models, storage, etc. An addition built during the last year, for a blacksmith shop, 32 by 36 feet, contains sixteen forges, with anvils and tools, and a cupola for melting iron. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also supplied with gymnastic apparatus. One of the towers contains an armorer's shop and an artillery room; the other contains a printing office and editor's room.

The Chemical Building, erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 25,000 acres of well-selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and

county bonds amounting to $319,000, besides other property and avails valued at $33,000.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich, and equalled at few, if any, of the colleges of the West. Among these collections are included the following:

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils obtained from Germany, with collections of fossils of this and other States, illustrates the different formations, and is suitably arranged for practical study. There is a good collection of foot-prints from the Connecticut sand-stones.

Conchology.—A large collection of shells, fully illustrating the principles of conchology as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals with the single exception of the order of proboscidea; also typical representatives of the amphibious reptiles and of fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivors and fur-bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of the grasses and sedges. There are, besides, many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees

and shrubs of Stephenson County, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized; these, with a complete set of imported models, fully illustrate crystallography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

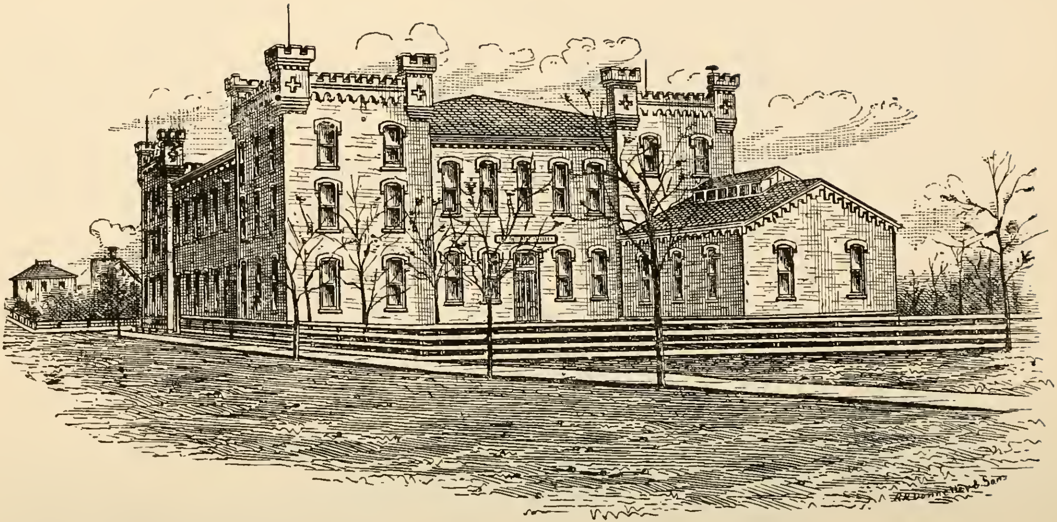
The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

A series of standard weights and measures has been received from the office of the Coast and Geodetic Survey of the United States Government, and may be consulted at the Physical Laboratory.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, drill presses, and the requisite hand tools, benches, vices, anvils, etc., for pattern-shop, blacksmith-shop, moulding-room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work-shops of the University.

Mining Engineering is illustrated by a valuable series of models, ob-



DRILL HALL AND MACHINE SHOP.

tained from Freiburg, illustrating sections of mines, machinery for elevating and breaking ore, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture, it embraces thirteen full-size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

Museum of Engineering and Architecture.—A large room is devoted to the gathering of a museum of practical art, the materials for which have been constantly accumulating in the various schools of science. It will contain full lines of illustrations of the work of the shops; models made at the University and purchased abroad; drawings in all departments; patent-office models, etc.; samples of building materials, natural and artificial; with whatever may be secured that will teach or illustrate in this most important phase of University work.

A notable feature of the collections is the gift of Henry Lord Gay, Architect, of Chicago. It consists of a model in plaster, and a complete set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first King of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was to have been seven and a quarter millions of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for political reasons. Mr. Gay's generous gift occupies the place of honor in the Museum of Engineering and Architecture.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 14,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading-room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study is encouraged or required. The reading-room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received :

LIBRARY, 1884.

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Country Gentleman.
Breeders' Gazette.
Indiana Farmer
New England Farmer.
Michigan Farmer.
Farmer and Fruit-Grower.
Iowa Homestead.
Agricultural Gazette, *London.*
Gardeners' Chronicle, *London*
American Agriculturist.
Western Agriculturist.
Live Stock Journal.
Horticulturist.
Farmers' Review.
Veterinary Journal.

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Builder, *London.*
American Engineer
Transactions American Society of Civil Engineers.
Engineering News.
Engineering and Mining Journal.
Scientific American.
Scientific American Supplement.
Sanitary Engineer.
Van Nostrand's Engineering Magazine.
The Workshop.
American Architect.
American Machinist
Western Manufacturer.
Gazette of Patent Office.
Mechanics.
Locomotive.
American Artisan.

SCIENTIFIC.

Annales des Sciences Naturelles, *Paris.*
Science.
Nature, *London.*
American Naturalist.
Grevillea, *London.*
Journal of Microscopical Science.
Decorator and Furnisher
Art Amateur.
Portfolio, *London.*
Comptes Rendus, *Paris.*
Chemical News, *London.*
Journal of Chemical Society, *London.*
American Journal of Chemistry.
Boston Journal of Chemistry.
Jahrbericht der Chemie, *Giessen.*
Zeitschrift fur An Chemie
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Lancet. *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art
Journal of Franklin Institute.
Journal de Mathematiques
Mathematical Quarterly.
Mathematisches Journal.
Annals of Mathematics
Monthly Weather Review.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review
Contemporary Review.
Fortnightly Review.
North American Review
Atlantic Monthly
Century.
Dial.
Literary World.
American Journal of Education.
Education
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Princeton Review.
Nation.
Congressional Record.
American Protectionist
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Musical Record.
Signal.
The Rock-Islander.

The exchanges of the *Illini* are also free to the students in the Library.

Aims of the University.

THE University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus and conveniences, to fix the rates of tuition, to appoint such professors and instructors. and establish and provide for the management of such model farms, model art, and other departments and professorships. as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges, which are

subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.
School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.

School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, and Elocution are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required:—that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physiography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and Designing, Elements of Construction, Graphical Statics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, on the two days, previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and Composition. These are required, in addition to the subjects specified in 1 and 2, for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy; Latin Grammar and Reader, Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, in addition to the subjects of 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also "*Preliminary Year.*"

COUNTY SUPERINTENDENT'S CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches. Arithmetic, Geography, English Grammar, and History of the United States; applicants who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

College of Agriculture.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean,
PROFESSOR BURRILL,
PROFESSOR PRENTICE,
PROFESSOR McMURTRIE,
PROFESSOR JILLSON.

ADMISSION.

CANDIDATES for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that

man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming —of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning, and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; laws especially affecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: Orchard sites; the age of trees to plant; the season to plant; how to plant; what to plant; the management of the soil; pruning and care of trees; gathering and preserving fruit; diseases and injuries; the nursery; ornamental trees and shrubs; flower gardens; vegetable gardens including propagating beds and houses; the vineyard and small fruits, and timber tree plantations. Students have instruction and practice in grafting, building, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-graft of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the College. Excursions are made when found practicable for the study of public and private grounds.

The three following studies constitute a years' work designed for those who wish to prepare themselves for specially horticultural pursuits and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

5

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristic of each pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Plant-Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the domestic animals is taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge for the instruction of the students. Lectures are also given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the agricultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines, their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and special investigations by each student. A Thesis is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorolegy, see statements in *College of Natural Science.*

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, and several breeds of swine, to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture under the direction of the Professors of Agriculture and Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large windmill which furnishes power for grinding feed, and for other purposes.

A veterinary hall and stable have been provided, and a clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and teeth of the horse at different ages.

Surveying and drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College, there are: 1. A very large specimen apple orchard planted in 1869, and containing about 1,000 varieties,—many varieties of pears, cherries, grapes and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different material and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture; Chemistry; Trigonometry; Shop Practice (optional).
2. Elements of Horticulture; Chemistry; British Authors, or Free Hand Drawing.
3. Economic Entomolog;y Chemistry; Rhetoric.

SECOND YEAR.

1. Chemistry and Laboratory Practice; B tany; German.
2. Agricultural Chemistry (Soils and Plants); Zoology or Botany; German.
3. Agricultural Chemistry (Tillage, Fertilizers, Foods); Vegetable Physiology; German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; German.
2. Animal Husbandry; Veterinary Science; Veterinary Materia Medica (optional extra); Physics or Geology.
3. Landscape Gardening; Veterinary Science; Physics or Geology.

FOURTH YEAR.

1. Physiography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 32 and 33.

FARMER'S COURSE.

Students who can not give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Economic Entomology or Landscape Gardening.

College of Engineering.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean,
PROFESSOR SHATTUCK,
E. A. KIMBALL,
PROFESSOR BAKER,
PROFESSOR A. T. WOODS.
J. SONDERICKER.

SCHOOLS.

MECHANICAL ENGINEERING, ARCHITECTURE,

CIVIL AND MINING ENGINEERING.

ADMISSION.

APPLICANTS should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text book, and the drawings made on smooth paper, eight by ten inches.

STUDIES PURSUED BY ALL ENGINEERING STUDENTS.

The subjects common to all the schools in the College of Engineering will be described first; the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solu ion of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

Advanced Algebra.—Functions and their notation; series and the theory of limits; imaginary quantities; general theory of equation.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane, area, surface and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc.; algebraic curves.

Integral Calculus. Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; the point, right line, plane, and surface of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications; elements of elliptic integrals.

PHYSICS.

The course of Phy ics embraces the kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once ea h week, in which the more co t-ly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, opti s, and electric ty from Stoehrer of Leipsic, and Browning and Newton of London; pneumatic and electrical apparatus from E. S. Ritchie of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Bros., London, resistance coils, galvanometers, etc., for higher researches in electricity.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of discriptive geometry; use of water colors; Isometrical drawing; shades and shadows; perspective; drawing of machines, bridges, roofs, etc., finished by line shading, tints, and colors.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering..—Plain and ornamental alphabets; titles and title-pages; round and stump writing.

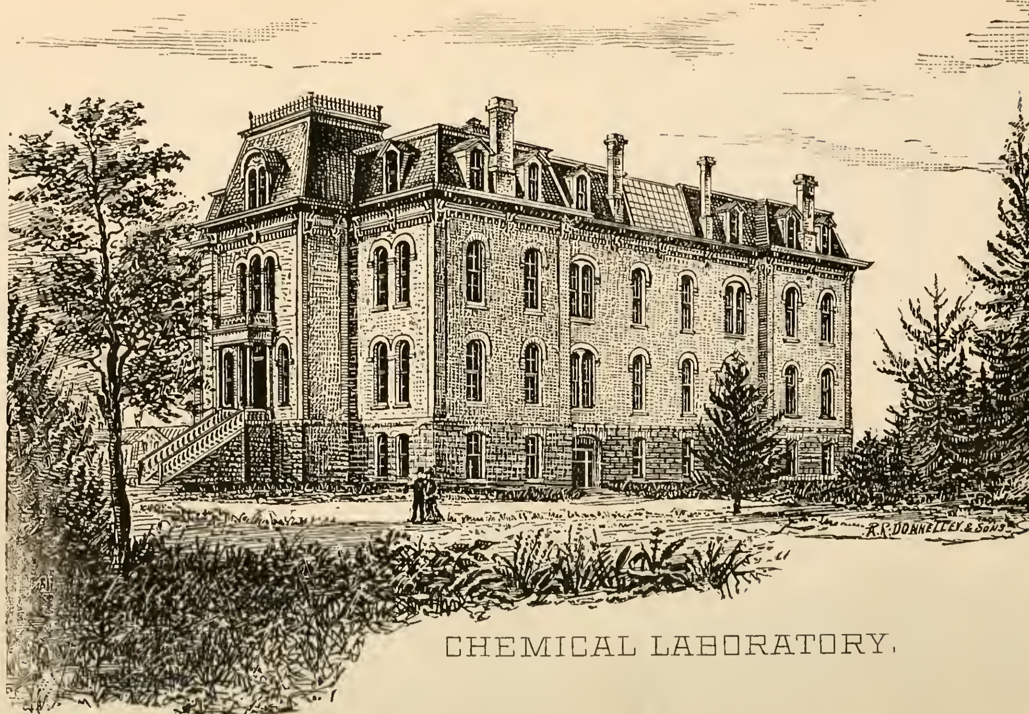
Descriptive Geometry.—Problems on the point, right-line and plane; warped surface; perspective; shades and shadows; practical problems.

APPLIED MATHEMATICS.

Analytical Mechanics.—Polygon of forces; equations of equilibrium of moments; center of gravity; moment of inertia; acceleration, work, momentum, impact; motion of free particles; central forces; constrained motion.

Strength of Materials.—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Hydraulics.—Amount and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains



CHEMICAL LABORATORY.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises:

For manuscripts and unimportant drawings, a heavy flat-cap paper.

For ordinary drawings, not colored, a heavy, first-quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings, and lettering, the best three-ply Bristol board. For problems, exercises, lecture notes, theses, and other manuscripts, and for geometrical projection, topographical, railroad typographical, and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used it must be cut 8x10 inches, and the binding margin hinged on with muslin.

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink or colors. It must be upon regulation paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labelled with donors' names, and placed in the Museum of Engineering and Architecture, for the inspection of students and the illustration of lectures.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The State needs men who to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory, is counted as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and by text books. Examples are given showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents four different shops, viz:

1—PATTERN MAKING.
2—BLACKSMITHING.
3—BENCH WORK FOR IRON.
4—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in com-

bining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made, from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, there is first a course of free-hand bench work, the cold chisel and file being the only tools. After the hand and eye are sufficiently trained, fitt ng is begun, and the square, bevel, rule, compasses and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 4th shop the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Lectures are given in which the most favorable forms and manipulations of cutting tools and auxiliary appliances are explained.

Previous to the shop work, drawings of the pieces are made by the student and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact,cams and curves in sliding contact; gear teeth; gearing chains; escapements; link work.

Prime Movers.—The theory and useful effects of turbine water-wheels and best form of the parts for high efficiency. Other water-wheels and wind-wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill-Work and Machinery.—Trains of mechanism studied with reference to their resistance and efficiency; best forms for transmission of

power for short or great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the Mechanical Laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by

purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop furnished with complete sets of tools, benches, vises, and forges.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; German or French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; German or French.
3. Advanced Algebra; Free Hand Drawing; Shop Practice; German or French.

SECOND YEAR

1. Calculus; Designing and Construction of Machines; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German or French.
3. Advanced Calculus; Astronomy; German or French.

THIRD YEAR.

1. Mechanism; Advanced Descriptive Geometry; Chemistry.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Engineering Material; Physics.

FOURTH YEAR.

1. Prime Movers; Resistance of Materials and Hydraulics; Mental Science
2. Prime Movers; Construction Drawing; Constitutional History.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of either French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text books, and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid interference of hours of recitation and because the studies are there given in that order which best meets the preparation of the student.

TECHNICAL STUDIES.

Astronomy.—Descriptive Astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the altazimuth instrument, the astronomical transit, the sextant, and the engineer's transit adapted to astronomical work, and by astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges.—Calculations of stresses in the various forms of bridge trusses, by algebraic and graphical methods, consideration being given

to weights of bridge and train, and force of wind; designing trusses and proportioning sections.

Geodesy.—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; projection of maps.

Land Surveying.—Areas and distances, by chain, compass, and plane table; omissions and corrections; metrical system; methods of U. S. public land surveys; magnetic variation; determination of true meridian.

Railroad Surveying.—Economic location; curves and grades, and their inter-adjustment; earth-work; curvature and elevation of rail; easement curves; turnouts; crossings; maintenance of way.

Stone Work.—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topography.—Use of stadia, plane-table, and level; contours; soundings. Sketching, mapping, conventional signs; city and county maps.

Theory of Engineering Instruments.—Examination of workmanship and design; testing instrument maker's adjustments; engineer's adjustments; determination of areas with transit; inaccessible and air line distances; profiles; heights and distances with stadia; measurement of angles with sextant, etc.

PRACTICE.

In the fall term of the second year, the class will solve numerou problems in distances, areas, etc., using the chain, compass, and plane-table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topograpical survey of a locality is made by the class, in which the stadia and plane-table are used as in the United States surveys.

In the fall term of the third year the class will execute a project in railroad engineering which will consist of preliminary surveys, location staking out, drawings, computations of earth work, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in goedesy or higher engineering, will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice.—The school is well provided with the instruments necessary for the different branches of engineering field practice, which includes, chains, tape, compasses, plane-tables, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observations. An astronomical observatory is provided with an equatorial telescope, an astronomical transit, with an attachment for zenith telescope work, a chronometer, and a set of meterological instruments.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton & Simms of London, is used for instruction in Geodesy and Practical Astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photo-lithographs of bridges, roofs, and engineering structures; it has access to the Museum of Engineering and Architecture, which contains models illustrating wood, stone, and metal construction, and to a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The Library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; French or German.
3. Advanced Algebra; Free-Hand Drawing; French or German.

SECOND YEAR.

1. Calculus; Land Surveying; French or German.
2. Advanced Analytical Geometry; Surveying and Theory of Instruments; French or German.
3. Advanced Calculus; Topographical Surveying and Drawing; French or German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry; Railroad Engineering
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geodesy and Practical Astronomy*; Mental Science
2. Bridges;* Geology; Constitutional History.
3. Stone Work; Bridge Construction*; Political Economy.

MINING ENGINEERING.

Students in Mining Engineering will take a course in Metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores, and rocks. In the Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces, and other apparatus required for practical instruction in this department.

In each of these courses the student will take two years of German or French, but not one year of each.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory has the following position:

Latitude 40° 6′ 29″ 66 .77
Longitude, West of Washington, { 11° 10′ 37″.5 / 44m. 42.5s.
Elevation above sea-level, 720ft.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The school prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

The course embraces the knowledge of theory and principles, of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with reference to text books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed; also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

TECHNICAL STUDIES.

Elements of Drawing—Lectures; designs for specified problems; outline sketches and finished drawings from casts in pencil, crayon, and charcoal.

Wood Construction—Frames, roofs, ceilings, domes, heavy frames for mills, etc, roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating and Plastering.

Sanitary Construction—Scientific principles and practical methods employed in plumbing, water supply, and drainage of buildings.

Architectural Drawing—Finishing in line, ink, sepia, and color; working out from sketches full sets of drawings for buildings; practical perspective, and shades and shadows.

Architectural Designing—Original sketches for specified projects; one full set of drawings for buildings for specified private or public purpose.

History of Architecture—Daily lectures and recitations on principal styles, their characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracing of details; designs for special problems.

Esthetics of Architecture—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings; art objects, furniture, carpets, etc. About twenty-five original designs required for specified objects.

Estimates—Methods of measurement; cost of labor and materials; estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products. Problems and applications to specified buildings.

Graphical Statics—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such plates must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term—Carpentry and Joinery. Planing flat, square, and octagonal prisms, and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; miter, lap, and gained joints; through and lap dovetails; mouldings, miters, and panels.

Second Term—Turning and cabinet making; cylinders, balusters, capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering; inlaying, carving, and polishing.

Third Term—Metal work, pattern making, moulding and casting, filing and finishing, drilling, screws, hand and machine turning.

Stone work executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr, of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof-trusses and stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and

splitting saws; planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

BUILDER'S COURSE.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making)

ARCHITECTURAL COURSE.

Required for the Degree of B. S., in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Advanced Algebra; Graphical Statics; Shop Practice; French.

SECOND YEAR.

1. Elements of Wood Construction; Calculus; Free Hand Drawing and Modeling.
2. Elements of Stone, Brick, and Metal Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Elements of Sanitary Construction; Advanced Calculus; Water Color Sketching

THIRD YEAR.

1. Architectural Drawing; Advanced Descriptive Geometry; Chemistry.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture; Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization
2. Architectural Designing; Heating and Ventilation; Constitutional History.
3. Architectural Designing; Estimates, Agreements, and Specifications; Political Economy.

College of Natural Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR BURRILL, Dean,
PROFESSOR PRENTICE,
PROFESSOR McMURTRIE,
PROFESSOR JILLSON.
PROFESSOR ROLFE,
MR. PALMER.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

ADMISSION.

CANDIDATES for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in the course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

The first term of the first year is occupied by text-book instruction and lectures on the elementary principles of chemistry, chemical physics,

and inorganic chemistry. The second term is devoted to laboratory practice in qualitative analysis. In the third term recitations upon organic chemistry alternate with laboratory practice in qualitative analysis. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Text Books—Roscoe's Chemistry; Fresenius' Analysis; Bolton's Analysis; Sutton's Volumetric Analysis; Bunsen's Gasometry; Rickett's Assaying; Gore's Electro-metallurgy; Johnson's How Crops Grow and How Crops Feed.

Books of Reference—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Roscoe and Schorlemmer's Treatise on Chemistry; Armstrong's Miller's Chemistry; Lehmanns's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poisons.

Deposits—At the beginning of each term of Laboratory practice each student will deposit eight dollars with the business agent of the University. At the end of the term the balance left, after deducting payment for gas, chemicals, and apparatus used, will be refunded.

Five courses of laborato y work have been arranged as follows:

CHEMICAL COURSE.

FIRST YEAR.

First Term—General theoretical and applied chemistry. Lectures and text-book.

Second Term—Qualitative analysis begun; tests and separation of the bases and acids.

Third Term—Qualitative analysis completed. Examination of 20 simple salts and 20 compound substances, natural and commercial products. Organic chemistry. Text-book and recitations.

SECOND YEAR.

First Term.—Qualitative analysis of barium chloride, magnesium sulphate, ammonio-ferric sulphate, potassium-sodium tartrate, sodium phosphate, calcite, silver coin, nickel nitrate, copper arsenite. Duplicate determinations in each case. Preparation of salts.

Second Term.—Qualitative analysis of calamite, lime-stone, spathic iron ore, copper pyrites, galena, nickel ore, clay, soil. Preparation of salts.

Third Term.—Volumetric analysis, Preparations of standard solutions, alkalimetry and acidimetry, analysis of sodium hydroxide, sodium carbonate, potasium hydroxide, cream of tartar, hydrochloric, sulphuric, nitric, oxalic, and acetic acids; of iron, copper, silver, zinc, lead. Preparation of salts.

THIRD YEAR.

First Term—Ultimate organic analysis. Determination of carbon, hydrogen, nitrogen, chlorine, phosphorus and sulphur in organic compounds. Analysis of urine. Preparations.

Second Term.—Assaying In both the dry and wet way of gold, silver, tin, nickel, and lead ores. Bullion Blow-pipe analysis of silver ore. Preparations

Third Term.—Analysis of commercial fertilizers, phosphates, nitrogenous matters, and alkaline salts. Analysis of milk, butter, corn, wheat. Examination of alcoholic liquors. Preparations.

FOURTH YEAR.

First Term.—Gas Analysis. Calibration of eudiometers. Analvsis of air from beings, atmospheric air, marsh gas, illuminating gas, crude coal gas. Analysis of mineral water Preparations.

Second Term.—Toxicology. Micro-chemistry of poisons. Testing for mineral and vegetable poisons. Separation from organic mixtures. Preparations.

Third Term.—Original researches Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in chemical course.

Second Term.—Quantitative analysis of commercial drugs, white lead, Paris green, bismuth subnitrate, tartar emetic, sodium bicarbonate, potassium nitrate, ammonium carbonate, cream tartar, commercial hydrochloric, nitric, and sulphuric acids. Preparations.

Third Term.—Same as in Chemical course.

THIRD YEAR.

First Term—Same as in chemical course, substituting preparation and analysis of organic chemicals for analysis of urine.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs, oils, resins, gums, alkaloids, glucosides, etc.

Third Term.—Materia Medica. Reading and compounding perscriptions. Preparation and valuation of tinctures and extracts. Examination of commercial organic drugs.

FOURTH YEAR.

First Term.—Analysis of urine, normal and pathological. Mineral waters. Examination of alcoholic liquors.

Second Term.—Toxicology. Micro-chemistry of poisons. Separation of poisons from organic mixtures.

Third Term. Original researches. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

Arranged for students desiring to make a specialty of this branch.

FIRST YEAR

Same as in Chemical course.

SECOND YEAR.

First Term—Quantitative analysis of barium chloride, magnesium sulphate, ammonium sulphate, calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term—Analysis of ashes of plants, soil, mineral waters.

Third Term—Analysis of commercial fertilizers, manures and minerals used for manures, apatite,.phosphates, guanos, nitrates.

THIRD YEAR.

First Term Same as in chemical course, omitting analysis of urine. Analysis of corn, wheat, and fodder.

Second Term - Analysis of milk, butter, cheese. Analysis of sugars by polariscope and by titration. Examination of alcoholic liquors

Third Term—Original researches.

COURSE IN AGRICULTURAL CHEMISTRY.

Especially arranged for students in the School of Agriculture.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term—Quantitative analysis of barium chloride, ammonium sulphate, calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term—Analysis of soil, ashes of plants, commercial fertilizers, manures, and materials employed in their production, apatite, phosphates, guanos, animal m tters, ammonia salts, nitrates, and marls.

Third Term—Analysis of corn, wheat, hay, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course, omitting organic chemistry in third term.

SECOND YEAR.

First Term—Quantitative analysis of barium chloride, Magnesium sulphate, Ammonio-ferric alum, nickel nitrate, silver coin, brass, type metal, solder.

Second Term—Assaying.* Same as in Chemical course.

Third Term - Analysis of calamine, spathic iron ore, magnetic iron ore, copper pyrites, galena, nickel ore, manganese ore, cinnabar, grey antimony.

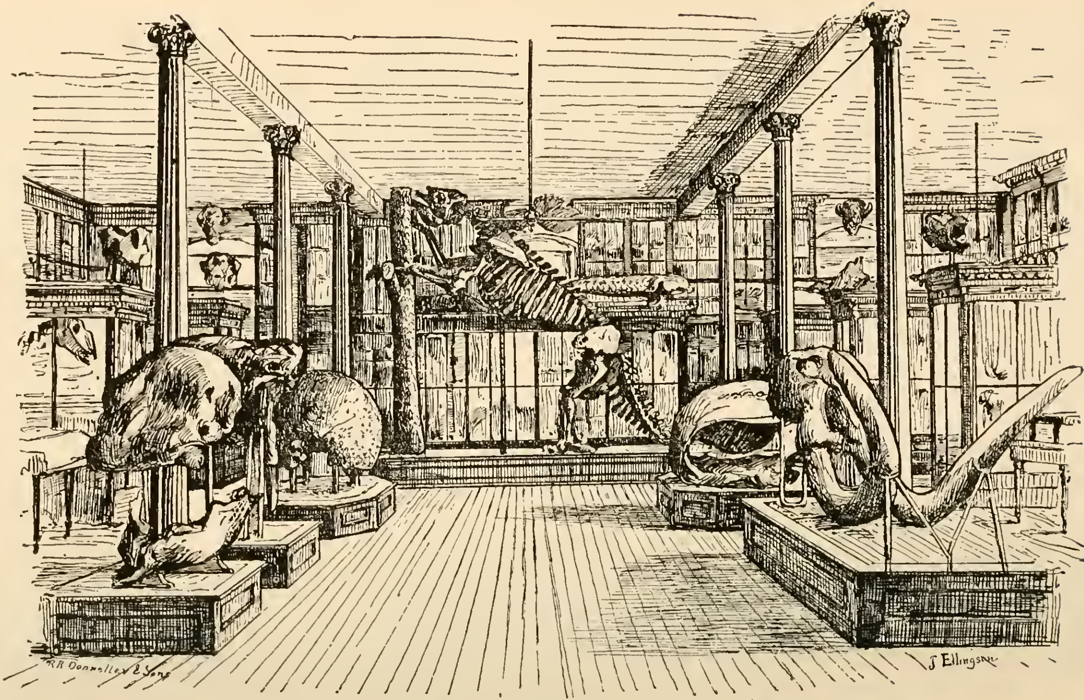
THIRD YEAR.

First Term—Analysis of slags from copper, zinc, and lead; iron furnace and mill slags,

Second Term—Analysis of pig iron, wrought iron, steel, commercial copper, lead, zinc, bullion.

Third Term—Analysis of fuels, wood, anthracite and bituminous coals, coke, determination of heating power. Analysis of ashes and furnace cinders; mineral waters.

*Students who take this term's work must have had a term of Mineralogy.



MUSEUM.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected, at an expense, including furniture, of $40,000.

The basement contains a furnace-room for assaying and metallurgical operations; a mill-room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture-room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood, gas, and water. There are a spectroscope table, a blowpipe table for general use, and a store-room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing eight chemical balances of the manufacture of Bunge (short beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; a private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, an induction coil, battery, mercury, etc.; and a store room with apparatus for all kinds of work in quantiative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of aeometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen and a potassium dichromate battery; a galvanometer; a spectroscope; a large binocular microscope; a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry, General and Applied; Trigonometry; American Authors or French.
2. Chemistry and Laboratory Practice; Conic Sections; British Authors or French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry and Laboratory Practice; Microscopy; German.
3. Agricultural Chemistry and Laboratory Practice; Vegetable Physiology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR

1. Laboratory Practice; Mental Science; Physiography.
2. Laboratory Practice; Constitutional History; Logic.
3. Laboratory Practice; Political Economy; Geology.

Students who are candidates for the degree of B. S. in the school of chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

A term of Photography will be provided for students who desire it; it will consist of text-book work, with recitations and daily practice.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany. Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the Sophomore year, systematic and structural Botany is continued by recitations, illustrated lectures and laboratory work upon fresh, dried, and alcoholic

specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of those drawings upon a uniform scale, together with the accompanying descriptions, is deposited in the Laboratory. Each Student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's), and Bessey's Botany are required. For the compound miscroscopes and other apparatus furnished by the University, a deposit of three dollars is required, but no charge is made except for damage and material used. The first half of the term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance; etc., together with a history of a few special plants and their products. During this time, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramineæ, etc., especially such as are best obtained in Autumn. During the last half of the term the general morphology of plants, including vegetables anatomy and histology, is studied, practical laboratory work being the basis of the instruction. Tests are made from time to time by the use of disguised vegetable substances.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied.

The most important books of reference in the English language are Sachs' Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cooke's Fungi and Handbook of British Fungi.

Vegetable Physiology is studied in the third term. The instruction is given by lectures and experimental practice. The work includes:—the food of plants and its absorption and assimilation; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.; processes, peculiarities, and results of growth; relations and effects of temperature, light, gravitation, etc.; self and cross fertilization, relations of plants and insects; movements, "sleep of plants," tendrils; climbing vines, etc.; origin and development.

Throughout the course, the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authorities for the facts stated.

Microscopy and Fungology.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly but not exclusively devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skillful and rational use of the instrument and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn-tables, etc., are furnished by the University.

Anatomy and Physiology.—This subject is presented during the first term of the Junior year. Anatomy is taught by lectures illustrated by skeletons, manikin, models in *papier-mache*, and microscopical preparations. Fresh specimens of various organs are dissected and demonstrated before the class during the term. Physiology is taught by lectures, demonstrations, and recitations from Martin's treatise, The Human Body.

The library contains many of the best books of reference, including works on Anatomy by Gray, Holden, Quain, Ellis, and Morton; and on Physiology by Flint, Dalton, Kuss, McKendrick, Kirk, Draper, and Marshall.

Zoology is taught during the whole of the Sophomore year from a text-book, and by lectures and practical work in the Laboratory. The text-book used is Packard's. The laboratory work involves the study by dissection of the organs of respiration, circulation, digestion, and locomotion of the higher animals, and of the lower forms as far as may be done with the aid of the microscope.

Geology is taught during the second and third terms of the junior year. LeConte's Geology is used as a text-book. The first term is given to instruction upon the dynamical effects of water in eroding, transporting, and depositing materials; upon the action of heat as manifested in metamorphism, crystalization, consolidation, and the production of mountain folds; upon the nature and material of rocks, veins, dykes, etc., and upon the arrangement and distribution of metals and their ores. The second term is devoted to the consideration of the historic development of the earth as revealed by the study of the animals and plants entombed

therein; and to a discussion of the elements of time, the system of life, the origin of species, and the antiquity of man.

Osteology and Taxidermy are taught in extra classes.

Physiography, or "the study of nature" is, taught by illustrated lectures during the first term of the Senior year. The subjects considered are the origin of the earth, and its relation to other worlds; the distribution of land and water; the direction and extent of mountain chains and of ocean currents; the influences which determine the climate of any locality; the systematic distribution of animals and plants; and especially the biological position of man, and his relation to the animate and inanimate worlds around him.

Entomology.—After some introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classifications. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term, lectures are given upon the description of insects, both injurious and beneficial, methods of exterminating, etc., with laboratory work, including naming of species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study.

Students are required to provide themselves with collecting nets and bottles, pins, lined boxes, and books for notes.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blowpipe. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western Plants; a collection of plants from Dr. Vasey, Botanist of the Depart-

ment of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has compound microscopes of four different styles from Europe, two by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands were manufacture in the shops of the University.

Zoology.—The Museum is particularly fortunate in its collections in Zoology, possessing, in mounted specimens or skeletons, nearly all the ruminants of North America, and representatives of all orders of mammals, except Proboscidæ; exhibiting fifty species by eighty mounted specimens, with numerous skeletons. In birds it represents all the families of North America, having two hundred and forty species, represented by over four hundred specimens. Its Articulates number more than three thousand specimens; it fishes, four hundred; its radiates, three hundred, and its reptiles nearly one hundred. Sea, land, and fluviatile shells are represented by seventeen hundred species on deposit, The museum also contains nearly one hundred specimens, representing the osteology of vertebrates; a large collection of the nests and eggs of birds; a collection of Indian implements; and a manikin, a dissected eye, and a trachea, in *papier mache.*

Geology.—The Geological Cabinet contains Prof. Ward's celebrated college series of casts of famous fossils, including the gigantic megatherium nearly eighteen feet in length; the head of the Elephas Ganesa with tusks ten and a half feet long; the Collossochelys Atlas,—a gigantic tortoise with a shell eight feet by six; and the Plesiosaurus Cramptoni twenty-two and a half feet by twelve and a half feet. It also contains a series of tracks in the sandstone of the Connecticut river; a large collection of carboniferous ferns from the celebrated locality at Morris, Ill.; several thousand specimens of fossils from the State Geological Survey, and from purchase in Europe; and a large number of specimens illustrating building materials, dikes, veins, metamorphism, drift bowlders, etc.

Minerology.—The Cabinet of Minerals consists of a valuable and extensive collection of the leads of the State, and accompanying mineral; a collection of models, comprising the most important forms, and combinations in the various systems of crystallization; and a very complete collection of minerals, both American and foreign.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S., in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing, (optional); Trigonometry; French.
2. Chemistry; Free-Hand Drawing, (optional); Conic Sections; French.
3. Chemistry or Free-Hand Drawing; Economic Entomology; Rhetoric; French (extra).

SECOND YEAR.

1. Zoology; Botany; German
2. Zoology; Botany; German.
3. Zoology; Vegetable Physiology; German.

THIRD YEAR.

1. Anatomy and Physiology; Mineralogy; German; Ancient History (optional, extra).
2. Geology; Physics; German; Mediæval History (optional, extra).
3. Geology; Physics; Modern History.

FOURTH YEAR.

1. Physiography; History of Civilization; Mental Science.
2. Microscopy; Constitutional History; Logic
3. Natural History Laboratory Work; Astronomy; Political Economy.

In this course three terms of University Latin will be accepted in lieu of three terms of French; and five terms of such Latin for five terms of German.

College of Literature & Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean;
PROFESSOR PICKARD,
MISS E. M. HALL,
PROFESSOR SHATTUCK,
PROFESSOR CRAWFORD,
MISS M. E. DARROW.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

CANDIDATES for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Lation after entering, with the aid of private tutors. but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the school of Ancient Languages will be examined in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody, (Harkness', or Allen and Greenough's); Latin prose composition, (forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 196, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); for books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's,) Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and diphthongs, and pronunciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, writers, and professors, in their special departments, require a knowledge of the ancient, as well as of the modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industral schools of the country, and investigators and writers for the arts.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, and other work intended to illustrate the studies pursued, and to exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant used of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of

practice in English Composition, should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with a requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over thirteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on page 26.)

SUBJECTS COMMON TO THE SCHOOL OF THIS COLLEGE.

MATHEMATICS.

First Term.—Trigonometry, plane and spherical; fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; angles as functions of sides and sides as functions of angles; applications.

Second Term—Conic Sections, geometrical method. Definitions and general properities of the ellipse, hyperbola, and parabola; curvature of the conic sections. Analytical Geometry, elements of. Properties and relations of the point and right line in a plane; of the conic sections.

Third Term.—Advanced Geometry; Modern Geometry. Harmonic proportion and harmonic pencils; anharmonic ratio and involution; poles and polars in relation to a circle; the radial axes and centers of similitude of two circles; the principle of continuity; elementary principles of projection.

Text Books.—Coffin's Conic Sections and Analytical Geometry; Mulcahy's Modern Geometry.

PHYSICS AND ASTRONOMY.

For these subjects, see College of Engineering.

NATURAL SCIENCES.

See College of Natural Science.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the Junior and Senior years of the University Course.

JUNIOR YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; General European History; European Geography

SENIOR YEAR.

Constitutional History of England and the United States; History of Civilization; Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers and are therefore confined to the Senior year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful conditions of thought, growth and decay of mental and moral powers. Philosophy of education, theory of conscience; nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and in the formation of the habits of thinking and common judgments of life.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of The School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical languages. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read the entire works of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German; to Philology; to the Philosophy of English Literature, and to Esthetics. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage in linguistic culture is gained by the student. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition, and conversation.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia; French; Trigonometry.
2. British Authors or Livy; French; Conic Sections.
3. Rhetoric; French; Advanced Geometry, or Free-Hand Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology or Botany.
2. English Classics; German; Zoology or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History.
2. German; Physics; Mediæval History.
3. German; Physics or Chemistry; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. Early English; Logic; Constitutional History.
3. Philology; Political Economy; Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in Ancient languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of

the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year ancient history is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for the students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Odyssey and prose compositions; Conic Sections.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Advanced Geometry.

SECOND YEAR

1. Satires of Horace; Thucydides or German; Physiology.
2. Terence; Sophocles or German; Zoology.
3. Tacitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. Mental Science; History of Civilization; Physiography.
2. Logic; Constitutional History; Early English
3. Political Economy; Philology; Geology.

Additional Schools.

Not Included in the Four Colleges.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR CHARLES MCCLURE,

2ND LIEUT. 18TH INFANTRY, U. S. A.

BY the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the Preparatory year and of College classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc.
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties; Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is now under the charge of Lieut. Charles McClure, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other

courses of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as captains, by brevet, in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term of their attendance, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms under careful leaders. Fee 50 cents.

The University Cornet Band is composed of students who while members of the band are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

3. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signaling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signaling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

SCHOOL OF ART AND DESIGN.

PROFESSOR PETER ROOS.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen course may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufacturers, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

Students not seeking a professional training may yet avail themselves of the two years' course in industrial art. Any person of ordinary ability who faithfully completes this course will be qualified to teach drawing and designing in the public schools, or to enter professions with great advantage in the various branches of industry, where artistic skill and taste are indispensible to success.

FIRST TERM

(Exercises in Outline.)

Elements of form; analysis of compound forms; elementary designs; elementary prespective by aid of objects; elements of historic ornaments; memory exercises.

SECOND TERM.

Enlargement and shading from copy; ornamental designs from plant form; naturalistic and conventional arrangement; harmonious lines and distribution of form; perspective drawing of objects, plants, etc.; features of the human head; history of early art.

THIRD TERM.

Outline drawing and shading from casts of ornament; application of decorative forms to flat and round surfaces under various conditions; designs for specified objects; advanced perspective and shadows; harmony and contrast of color, (lectures on art and its history.)

FOURTH TERM.

(Clay and wax modeling.)

Basso relievo ornament from the solid; features, and the human head from description; relievo ornament from shaded copies or drawings; original designs for decorative purposes; enlargements and reduction from casts; history of styles of ornament.

10

FIFTH TERM.

Shading from statuary casts, etc.; drawing of landscape and animals from copy in charcoal and sepia; color applied to decorative art; designs for useful objects; perspective drawings of interiors of rooms.

SIXTH TERM.

General review of the principal work done; specimen plates to be completed; optical and physical principles of color in nature; aerial perspective; sketching from nature in charcoal and color: artistic anatomy of form and proportion, by illustrated lectures; famous artists and their principal work.

Students having passed satisfactorily in the above course will be permitted to enter the advanced classes.

ADVANCED COURSES.

The following course is for those who wish to become accomplished either as designers, painters, or teachers. In order that the student may acquire thoroughness in the branch he wishes to pursue as a speciality, the subject has at this stage been formed into two divisions, decorative and pictorial. The teacher student must give attention to both branches, and with him theory will necessarily supersede practice. Opportunities will be afforded such pupils to teach in the elementary classes whereby greater efficiency will be acquired.

SPECIAL COURSE IN PAINTING.

Trees, animals, and figures from copy and from nature in pencil, charcoal, and sepia; aerial perspective.

Anatomy of expression; external muscular development; shading from statuary in charcoal and monochrome; composition drawing from description; memory exercises.

Water color painting from pictures; sketching from nature in sepia and water colors; copying from oil paintings of portraits and landscapes.

Sketching from nature in oil colors; rapid studies of interiors with varied arrangement of light and shade; pictorial composition introducing figures or animals; theory and history of art.

Portrait painting from life; pictures finished from sketches; studying of groups of still life subjects; painting of ideal composition of one or more heads; chemistry of color.

ADVANCED COURSE IN DESIGNING.

Studies in clay or wax.

Ornaments and plant form in basso relievo from flat examples; designs adaptive to useful objects; the human figure from cast or original composition, reproduced by casting in metal or plaster; process of manufacture; monumental designs

Shading from cast and from nature; classic objects and furniture enlarged from copy; designs finished with pen, brush, and di tempera color; architectural construction.

Designs for church decoration in historic styles; memorial windows for stained glass; decorative designs commemorating events in history; history of manufactures and important inventions.

ADVANCED TEACHERS' COURSE.

A teacher must be prepared for emergencies for which the professional designer or artist has no experience. A general knowledge of the several subjects is therefore recommended. The decorative and painting courses will be worked together so as to form a thorough course for teachers.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvenary's Studies, Books 1, 2 3; Loschhorn's Klavier-Technik; Czerny's Etudos de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op 740, Books, 1, 2, 3; Cramer's Studies, Books, 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction term of ten weeks—2 lessons a week,	$10.00
For term of ten weeks—one lesson a week	6.00
Practice on piano, one hour daily, per term	2.00

MRS. ABBIE WILKINSON,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies laying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents.

PREPARATORY STUDIES.

The studies taught in the preliminary year are as follows:

FOR COLLEGES OF AGRICULTURE, ENGINEERING, AND NATURAL SCIENCE.

First Term.—Algebra.—(Newcomb's) fundamental rules; factoring; common divisors and multiples; powers and roots; calculus of radicals; simple equations; proportion and progression. *Physiology.*—(Dalton's or an equivalent.) *Natural Philosophy.*—(Norton's or an equivalent.)

Second Term.—Algebra.—Quadratic equations, etc. *Geometry.*—(Chauvenet's) Plane Geometry, lines, circumferences, angles, polygons, as far as equality. *English.*—Elements of composition. (Gilmore's Art of Expression, or equivalent.) Orthoepy and word analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometery completed, including solid Geometry and the sphere. *English* as in the second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin.*—Cicero's Orations. *Greek*, Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin.* Virgil. *Greek*, Xenophon's Anabasis.

Third Term.—Geometry completed. *Latin*, Virgil's Æneid. *Greek.* The Anabasis.

N. B.—Greek is required only for the School of Ancient Languages. The School of English and Modern Languages requires Physiology, Natural Philosophy, and Botany, instead of Greek.

Students in the preparatory studies are not matriculated as members of the University. They pay no entrance fee, but are charged a tuition fee of five dollars a term, and the incidental fee of seven and a

half dollars a term. They have all the privileges of the library and of the public lectures, and are required to drill.

N. B. No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination within one year after the date of their graduation. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	Chas. Raymond,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	J. N. Wilkinson,	"
Urbana High School	J W. Hays,	"
Oak Park High School	B. L Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	O. S. Westcott,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park High School	Leslie Lewis, Supt.	
Marengo High School	G J. Allen,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High School	I. L. Becker,	"
Springfield High School	F. R. Feitshans, Supt.	
Monticello High School	G. A. Burgess,	"

Warren High School	D E. Graver,	Principal.
Peru High School	Joseph Carter,	"
Peoria High School	Geo. E Kneppler,	"
Galena High School	R L. Barton,	"
Shelbyville High School	J. F. Goudy,	"
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	P. R. Walker,	"
Rossville High School	W. A Chamberlin,	"
Bement High School	W E. Mann,	"
Oakland High School	Charles I. Parker,	"
Jacksonville High School	D. H. Harris, Supt,	
Danville High School	S. Y. Gillan,	"
Charleston High School	E. J Hoenshel,	"
Tuscola High School	F. A. E. Starr,	"
Streator High School	N. Williams	"
Ottawa High School		"
Bloomington High School	G. F. Draper,	"
Aurora E. Side High School	N. A. Prentiss,	"

UNIVERSITY DISCOURSES.

SECOND SERIES.

During the year a series of discourses has been delivered in the University Chapel on Sunday afternoons, by distinguished clergymen of various denominations, as follows:

Oct. 7. Rev. W. X. Ninde, D. D.,
SUBJECT; Perfection, the End of Christian Endeavor.

Oct. 28. Rev. Herrick Johnson, D. D.,
SUBJECT; Truth's Cost, Worth, and Betrayal.

Nov. 18. Rev. Wm. M. Lawrence, D. D.,
SUBJECT; Real Power.

Dec. 9. Rt. Rev. Alexander Burgess, D. D.,
SUBJECT; The Glory of the Church and the Loss of that Glory.

Jan. 27. Rev. E. C. Ray,
SUBJECT; Christ Blessing the Nations.

Feb. 17. Rev. F. M. Bristol,
SUBJECT; The Christian's Triple Motto.

March 9. Rev. H. M. Scudder, D. D.,
SUBJECT; Christians the Light of the World.

March 30. Rev. F. A. Noble, D. D.,
SUBJECT; Conversation.

April 20. Rt. Rev. Samuel Fallows, D. D.,
SUBJECT; A Wheel in the Middle of a Wheel.

May 11. Rev. Galusha Anderson, D. D.
SUBJECT; Do we ever really forget?

The expenses of this course have been generously defrayed by Mr. Albert C. Burnham, of Champaign.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as president of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree, and must present an accepted thesis.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The degree of Bachelor of Letters, B. L., will be given to those

who complete the course in the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course in the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued, and passed examinations on, a year of prescribed post-graduate studies, or after a term of three year's successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding houses in Urbana or Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2.00 per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses see page 82.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their preficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed :

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 28 and 29.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College (See page 76.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount $10.00

THE TERM FEE for Incidental Expenses is, for each student............ 7.50

Room Rent in University Dormitory, each student per term, $2.00 to 6.00

Each student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $8, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are the estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University:

	MIN.	MAX.
Term Fees and Room Rent for each student	$ 28 50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144 00
Fuel and Light	10 00	15.00
Washing, at 75 cents per dozen	13.50	27-00
Total Annual Amount	$124 00	$220.50
Board and Room in Private Houses, per week	4 00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$ 5.00
Incidental Fee, per Term	7 50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students	10 00
Graduating Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money,* without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

Calendar for 1884-85:

Examinations for Admission	Monday,	September 15
First or Fall Term begins	Wednesday,	September 17
First Term ends	Wednesday,	December 24

WINTER VACATION.

FOR 1885.

Examination for Admission to Advanced Classes	Tuesday,	January 6
Opening of the Second or Winter Term	Wednesday,	January 7
Anniversary Day.		March 11
Second Term ends	Wednesday,	March 24
Third or Spring Term begins	Thursday,	March 25
Baccalaureate Address in University Chapel	Sunday,	June 6
Class Day	Monday,	June 7
Alumni Day	Tuesday,	June 8
Commencement	Wednesday,	June 9

SUMMER VACATION.

Examinations for Admission	Monday,	September 14
First or Fall Term begins	Wednesday,	September 16

List of Graduates.

1872.

NAME.	OCCUPATION.	RESIDENCE.
Burwash, Milo B	Farmer	Champaign
Davies, John J—B S	Physician	Racine, Wis
Drewry, Henry N	Physician	Effingham
Flagg, Alfred M Capt	Lawyer	Sioux Falls, Dak
Hatch, Miles F	Lumberman	New Tacoma, W T
Lyman. George H	Civil Engineer	Little Rock, Ark
Mathews, James N	Physician	Mason
Parker, C E	Banker	Philo
Reiss, Willis A	Teacher	
Reynolds, S A Capt	Lawyer	Chicago
Rickard, Thomas E Capt	Farmer	Springfield
Ricker, N Clifford–M Arch	Professor of Architecture, Illinois Industrial University	Champaign
Rolfe, Charles W—M S	Assistant Professor of Natural Science, I. I. U	Champaign
Silver, Charles W	Co. Supt. of Sc'ls	Newton, Kansas
Silver, Howard	Prin. Pub. Schools	Hutchison, Kansas
Teeple, Jared	Merchant	Marengo
Wharton, Jacob N	Machinist	Bement?
Whitcomb, Alonzo L	Physician	Tolono
Wood, Reuben O Capt	Farmer	Woodburn

1873.

Graham, Charles P	Clergyman	New Salem, Kansas
Hatch, Fred L	Farmer	Spring Grove
Hayes, Charles I—B S	Assayer	Denver, Col
Hennessey, Augustus L	Editor	Chicago
Hill, Edgar L Capt	Farmer	Austin, Texas
Hook, Samuel H	Miner	Black Hills, Col
Morrow, Andrew T	Farmer	Tonganoxie, Kan

NOTE—Graduates who have the rank of Captain have received commissions from the Government of the State, as Captains in the Illinois National Guard.

NAME.	OCCUPATION.	RESIDENCE.
Ockerson, John A—B S	Civil Engineer	St Louis, Mo
Phillips, Parley A	Farmer	Damascus
Platt, Franklin C Capt	Lawyer	Waterloo, Iowa
Porterfield, Elijah N	Merchant	Kearney, Neb
Robbins, Henry E	Prin. Pub. School	Lyons, Iowa
Swartz, Alexander C–C E	Farmer	Beulah, Kan
Williams, Lewis E	Farmer	Montrose, Iowa

1874.

NAME.	OCCUPATION.	RESIDENCE.
Baker, Ira O—C E	Professor of Civil Engineering Ill Ind University	Champaign
Campbell, John P	Physician	Milton
Drewry, Ebenezer L	Lawyer	Effingham ?
Eaton, Herbert	Printer	Champaign
Ells, William C	Engineer of Masonry, A., T. & S. F and M. C. R. R.	Strong City, Kan
Estep, Harvey C	Civil Engineer	Olympia, W T
Foster, Charles W	Lawyer	Chicago
Gabrialial, Gregory	Missionary	Asia Minor
Gennadius, Panagiottis-B S	Commissioner of Agriculture	Athens, Greece
Jeffers, Charles P	Druggist	Swampscott, Mass
Pickrell, William	Farmer	Pickrell, Neb
Pierce, John L—B A	Lawyer	Norfolk, Neb
Reynolds, Henry S—M S	Assayer	Glendale, M T
Smith, Charles A—B S	Mech Engineer	Terre Haute, Ind
Storey, George	Civil Engineer	San Diego, Cal
Watts, William	Physician	Sylvania, Ohio
Wharry, Walter W Capt	Trav Salesman	Sycamore
Cheever, Alice	Mrs A H Bryan	Champaign
Potter, F Adelia—B L	Mrs H S Reynolds	Glendale, M T

1875.

NAME.	OCCUPATION.	RESIDENCE.
Barnard, D E	Farmer	Kankakee
Barnes, Arthur E—B S	Druggist	Topeka, Kan
Brown, Dillon S	Banker	Genoa
Brown, Ralph L—M L	Real Estate Agt	Aberdeen, Dak
Coddington, Vantile W	Architect	Kansas City, Mo
Dobson, Franklin P Capt	Civil Engineer	Grand View, Dak
Dunlap, Burleigh A	Lawyer	Urbana
Dunlap, Henry M	Farmer	Savoy
Eaton, Ernest	Editor	Champaign
Everhart, Winfield S Capt	Lawyer	Toledo
*Faulkner, James Capt	Oct 2 1882	Bloomfield, Cal

NAME.	OCCUPATION.	RESIDENCE.
Gridley, George N	Farmer	Half Day
Kenower, George F—M L	Farmer	Bolivar, Mo
Leflar, John E	Clergyman	Leavenworth Kan
Lyford, Charles C—B S	Vet Surgeon	Minneap'lis, Minn
McCauley, John C	Prin Pub Schools	Wilmington
Muller, John	Physician	St Louis, Mo
Parks, James H	Land Agent	Clarendon, Texas
Parsons, F A—M L	Hardware Merchant	Wellington, Kan
Patch, Emory	Machinist	Janesville, Wis
Pickrell, Watson	Live Stock Dealer	Pickrell, Neb
Pollock, William C	Lawyer	Mt Vernon
Robinson, Elna A	Machinist	Champaign
Scovell, Melville A—M S	Superintendent Kansas Sugar Company	Sterling, Kan
Scudder, Clarence O	Prin Pub Schools	Dixon
Shawhan, George R—B L	County Superintendent of Schools, Champaign County	Urbana
Tyndale, Henry H	Lawyer	New York, N Y
Warner, L Fenn		
Anderson, Laura	Mrs J R Greenhalgh	Champaign
Campbell, Amanda	Mrs Milton Moore	Mansfield
Hullinger, Kate	Mrs Sterlings	Parker, Dak
Kariher, Kate	Mrs Albert Eisner	Champaign
Kellogg, Flora L	Mrs Hudson	Coldwater, Iowa
Lee, Alice—B L	Mrs V W Coddington	Kansas City, Mo
Pierce, Fannie	At home	Champaign
Steele, Mary C—B L	Mrs N C Ricker	Champaign
Stewart, Maggie E—B L	Mrs H E Robbins	Lyons, Iowa

1876.

Allen, Ralph	Farmer	Delavan
Ballou, Edward L	Assayer	Igo, Cal
Campbell, James W	Lawyer	Topeka, Kan
Chandler, William B	Farmer	Bourbon
Clark, Charles W	Civil Engineer	St Louis, Mo
Drake, James F	Lawyer	South Pueblo, Col
Gill, John D	Lawyer	Chicago
Gore, Simeon T	Architect	Chicago
Gregory, Charles E—Capt	Lawyer	Carrington, Dak
Knibloe, Walter E	Teacher ?	Girard ?
Mackay, Daniel S	Lawyer	Mt Carroll
Mackay, Henry J	Lawyer	Mt Carroll
Mackay, William A Capt	U S Postal Service	Mt Carroll

NAME.	OCCUPATION.	RESIDENCE.
Mahan, H Weston	Merchant	Champaign
*Mann, A Howard	April 23 1879	Winnebago, Cal
Mann, Frank I Capt	Nurseryman	Gilman
Mann, James R Capt	Lawyer	Chicago
Noble, Louis R–B S Capt	Mech Engineer	Mattoon
Oliver, Will F Capt	Physician	Longton, Kan
Palmer, Frank M Capt	Lawyer	Kansas City, Mo
Pierce, Elon A	Teacher	Santa Rosa, Cal
Rhodes, James F	Lawyer	Durango, Col
Scribner, Artemus C	Commissioner	Minneap'lis Minn
Starr, Frank A E Capt	Lawyer	Portland, Ore
Stookey, D Wesley	Tile Manufacturer	Buffalo
Weston, Charles H	Lawyer	Chicago
*Wild, George A Capt	Nov 1881	Las Animas, Col
Williams, Thomas T	Farmer	Sterling
Holton, Mattie S	Mrs C I Hayes	Chicago

1877.

Abbott, Theodore S—B S	Civil Engineer	Laredo, Texas
*Allen, Charles W—B L	July 8 1880	Harristown
Barry, Charles H Capt	Insurance Agent	Alton
Barry, Frank—B L Capt	Special Freight Agt	Minneap'lis Minn
Blackall, C H, M Arch Capt	Architect	Boston, Mass
Brush, Charles E	Architect	Carbondale
Buckingham, William	Lawyer	Chicago
Bumstead, James E	Physician	Dundee
Clay, Luther G	Nurseryman	Cobden
Crow, Benjamin F	Manager M'f'g Co	Nebr'skaCity Neb
Elliott, Charles G	Civil Engineer	Tonica
Faulkner, Richard D	Merchant	San Francisco Cal
Gibson, Charles B Capt	Analytical Chemist	Chicago
Gilkerson, Hiram Capt	Farmer	Hampshire
Gilkerson, John	Lawyer	Hampshire
Kennedy, Allan G Capt	Manufacturer	Minneap'lis Minn
Lewis, Edward V Capt	Manufacturer	Council Bluffs, Ia
Llewellyn, J C—B S	Supt Street R R	St Louis, Mo
McPherson, John	Engineer	Lexington, Ky
Moore, John F	Architect	Minneap'lis Minn
Rice, George C	Farmer	Charity
Seymour, John J	Civ and Min Eng	Silverton, Col

NAME.	OCCUPATION.	RESIDENCE.
Sim, Coler L Capt	Druggist	Topeka, Kansas
Spence, Franklin	Farmer	Nauvoo
Stayman, John M	Machinist	Sterling, Kansas
Stoddard, Ira J Capt	Civil Engineer	Oskaloosa, Iowa
Ward, Walter P–B L	Lawyer	Spencer, Iowa
Whitham R F—B L Capt	Farmer	Olympia, W T
Wright, Myron J	Farmer	Woodstock
Adams, Nettie	Mrs W B Wilson	Indianapolis, Ind
Bogardus, Eva	Artist	Champaign
Broshar, Cornelia	Artist	Champaign
Conn, Emma	Music Teacher	Champaign
Falls, Ida Bell	At home	Champaign
Gregory, Helen B—B A	Artist	Atlanta, Ga
Maxwell, Emma C	At home	Philadelphia, Pa
Page, Martha	Mrs R F Whitham	Olympia, W T
Piatt, Emma C—B S	Mrs J C Llewellyn	St Louis, Mo
Skinner, Velma E	Mrs W P Ward	Spencer, Iowa
Smith, Avice	Physician	Kansas City, Mo
Switzer, Gertrude	Mrs H Peddicord	Champaign
Victor, Carrie	Teacher	Champaign

1878.

Baker, Edward J—B S	Farmer	Savoy
Ballard, Charles K—B S		
Bridge, W E—B S Capt	Farmer	Caldwell, Kan
Brown, Frank A	Lawyer	Aberdeen, Dak
Bullard, Samuel A—B S	Architect	Springfield
Burr, Ellis M—B S	Machinist	Champaign
Cofflin, Frank S	Lawyer	Taylorville
Coffman, Noah B—B S	Banker	NewTacoma, W T
Dean, Frank A Capt	Merchant	Ulysses, Neb
Francis, Fred	Watchmaker	Elgin
Gaffner, Theodore	Physician	Trenton
Gregory, A T—B A Capt	Real Estate Agent	Atlanta, Ga
Hauser, Henry—B S Capt	Civil Engineer	Socorro, Col
Lee, Ed O—B L	Lawyer	Mt Carroll
Lloyde, Frank H	Merchant	Champaign
McLane, James A—B S	Architect	Chicago
Moore, Aaron H		
Morava, Wensel–B S Capt	Machinist	Chicago
Patchin, John	Lawyer	Grass Lake, Mich

NAME.	OCCUPATION.	RESIDENCE.
Pollock, James L—B L	Lawyer	Mt Vernon
Richards, Charles L—B S	Lawyer	Chicago
Rudy, William D—B S	Government Clerk	Washington, D C
Rutan, Abram R	Farmer	Trinidad, Col
Savage, Manford—B L	Lawyer	Hebron, Neb
Sawyer, Hamlin W Capt	Real Estate Agent	North Loup, Neb
Sparks, Hosea B Capt	Miller	Alton
*Spradling, William F	November 30 1881	Greenleaf, Kan
Sprague, Martin	Lawyer	Forest City, Dak
Weed, Mahlon O—B S	Teacher	Greenwood, Neb
Whitlock, J F—B L Capt	Physician	Dwight
Ziesing, August—B S Capt	Civil Engineer	Chicago
Zimmerman, H W—B L	Chemist	LaSalle
Columbia, Emma	Mrs J R Mann	Chicago
Culver, Nettie M—B L	At home	Henry
Davis, Nannie J	Mrs M A Scovell	Sterling, Kan
Deardorf, Sarah C—B S	Mrs B F Donnell	Winfield, Kan
Estep, Ida M	Clerk	Olympia, W T
Estep, Jessie	At home	Rantoul
Larned, Mary S	Mrs F A Parsons	Wellington, Kan
Mahan, Jennie C	Mrs P W Plank	Champaign
Page, Emma—M L	Music Teacher	Kansas City, Mo
Page, Mary L—B S	Architect	Kansas City, Mo

1879.

Beardsley, Henry M—M L	Lawyer	Champaign
Bourne, Henry P—B S	Civil Engineer	Alamosa Col
Butler, William N	Lawyer	Cairo
Coburn, R P—B S Capt	Merchant	San Antonio, Tex
Freijs, Charles T Capt	Architect	Chicago
Gunder, James—B S	Civil Engineer	Fairmount
Hoit, Otis W—B S	Farmer	Geneseo
Johnson, William P Capt	Manager Coal Co	Milwaukee, Wis
Kays, Emery	Farmer	Buda
Kimble, Willis P—B S	Civil Engineer	Chihuahua, Mex
Kuhn, Isaac—B S	Merchant	Prescott, Arizona
Lee, Elisha—B S	Farmer	Hamlet
*Milton, Franklin S—B S	July 23 1882	Plattville, Col
Stanton, S C—B S Capt	Physician	London, England
Swannell, Arthur Capt	Merchant	Kankakee
Taft, Lorado Z—M L	Sculptor	Champaign

NAME.	OCCUPATION.	RESIDENCE.
Thompson, W A–B S Capt	Merchant	Chicago
Walker, Francis E Capt	Live Stock Breeder	Champaign
Whitmire, Clarence L	Medical Student	Chicago
Butts, Augusta E—B S	Teacher	Chicago
Hale, Belle—B S	Teacher	Kewanee
Kimberlin, Nettie D	Teacher	Mendota
McAllister, Nettie C–B L	Mrs J H Miller	Sandwich

1880.

Bley, John C–B S	Machinist	Rockford
Briles, Bayard S–B S	Physician	Etna ?
Conklin, Roland R	Banker	Kansas City, Mo
Cook, Charles F–B S	Merchant ?	Edwardsville ?
Groves, Charles W	Prin Pub School	Ivesdale
Hafner, Christian F		Oak Park
Harden, Edgar E	Banker	Liberty, Neb
Hatch, Frank W–B L		Garden Prairie
Hyde, Benjamin F	Draughtsman	Chicago
Jones, Richard D	Lawyer	Henry
Kingsbury, Charles S–B L		Leadville, Col
Neely, Charles G–B L	Lawyer	DuQuoin
Parker, William L–B S		Chicago
Robinson, A F–B S	Civil Engineer	Athens, Pa
Robinson, A S–B S	Journalist	Decatur
Savage, George M–B L	Lawyer	Elma, W T
Sondericker, Jerome–C E	Assistant Professor of Engineering and Mathematics, I. I. U.	Champaign
*Travis, William W	Sept. 30, 1883	Bloomington
White, Frank–B S		Stillman Valley ?
Bacon, Kittie I–B L	Teacher	Champaign
Batchelder, Augusta	At Home	Harristown
Lucas, Corda C	Teacher	Camargo
Parker, Minnie A–B L	Teacher	Decatur
Pearman, Ida–B L	Mrs C E Stevens	Logansport, Ind
Watson, Ella M–B S	Mrs J H Davis	DeKalb

1881.

Allison, James G	Stenographer	Galveston, Tex
Armstrong, James E—B S	Prin Pub School	Arlington Heights
Beach, Bayard E—B L	Real Estate Agent	Huron, Dak
Bellamy, Albert	Merchant	Girard
Birney, Frank L	Physician	Sadorus

1881.

NAME.	OCCUPATION.	RESIDENCE.
Boothby, Arthur—B S	Draughtsman	Providence, R I
Boyd, Comma N Capt	Farmer	Sheffield
Coddington, Arch O—B L	Prin Pub School	Barrington
Cooper, Fred E—B S	Druggist	Van Buren, Ark
Davis, Arthur E—B L	Medical Student	St Louis, Mo
Dennis, C H—B L Capt	Reporter	Chicago
Dressor, John C—B S	Bookkeeper	Jacksonville
Forsyth, James	Engineer	Sterling, Kan
Hammett, F W—B S Capt	Farmer	Camargo
Hill, Fred L	Leveler C, B & Q R R	Red Oak, Iowa
Hill, T C—B A Capt	Teacher	Upper Alton
Kingman, Arthur H	Supt Gold Mines	Charlotte, N C
McKay, Francis M—B L	Prin. Wash. Public School	Chicago
Mansfield, Willis A—B L	Physician	Lacon
Mason, William K—B S	Farmer	Buda
Morse, John H Capt	Prin Pub School	Metamora
Pearman, J Ora—B S	Medical Student	Chicago
Pepoon, Herman S–B S	Physician	Fremont, Neb
Pepoon, William A	Stock Raiser	Fort Niobrara, Neb
Philbrick, E–B S Capt	Civil Engineer	Chicago
Pletcher, Francis M—B S	Stock Raiser	Fort Niobrara, Neb
Porter, Frank H—Capt		San Jose, Cal
Ross, Sprague D—B S	Local Historian	Princeton
Schwartz, Joseph	Druggist	Salem
Seymour, Arthur B—B S	Naturalist	Cambridge, Mass
Slade, Byron A—B S Capt	Drug Clerk	Wabasha, Minn
Stacey, Morelle M—B L	Stenographer	Chicago
Sturman, James B–B L	Law Student	Champaign
Talbot, A N—B S Capt	Civil Engineer	LaJunta, Col
Weston, Wm S–B L & B S	Electrician	Chicago
Wilson, Maxwell B	Farmer	Paris
Baker, Kittie M	Music Student	Chicago
Barnes, Bertha E B L	Teacher	Pullman
Davis, Marietta—B L	Mrs H M Beardsley	Champaign
Elder, Loretta K—B L	Clerk	Topeka, Kansas
Hammett, Jennie M—B S	At Home	Camargo
*Lawhead, Lucie M—B L	May 1, 1884	Champaign
Lawrence, Nettie E	At Home	Belvidere
Macknet, Metta M I—B A	At Home	Girard
Thomas, Darlie—B L	Bookkeeper	Bloomington
Wright, Jessie A—B L	At Home	Champaign

1882.

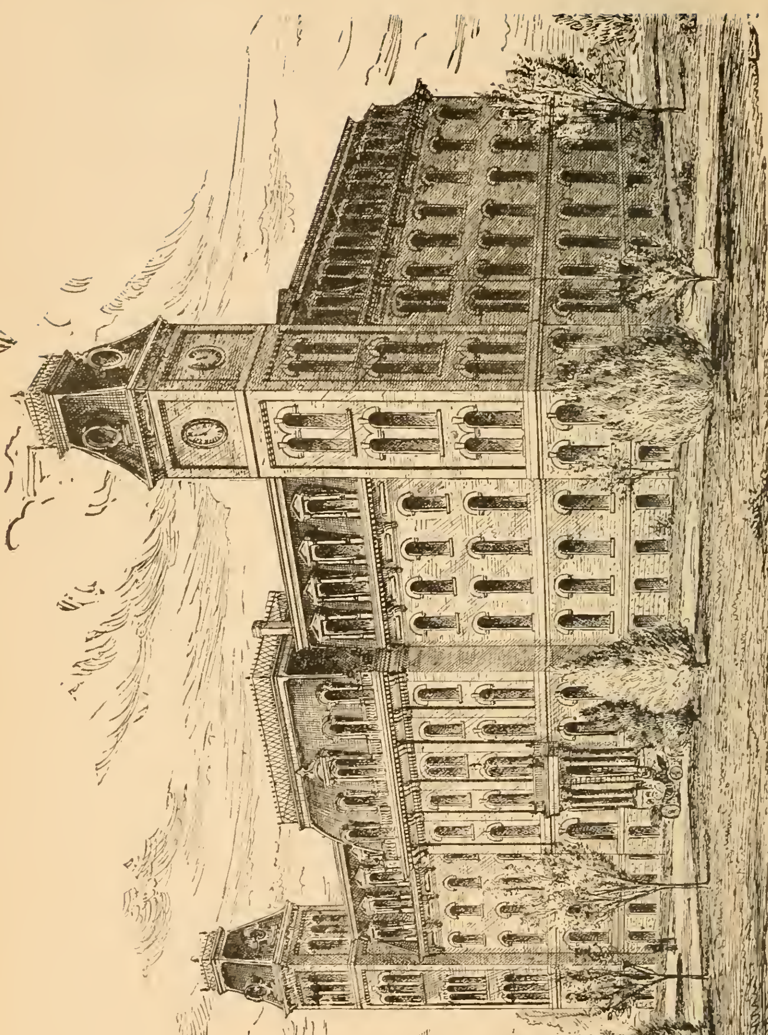
Bailey, Sam'l G jr Capt—B S	Merchant	Chicago
Barnes, Charles C	Supt Sugar Factory	Franklyn, Tenn
Bridge, Arthur M Capt	Stock Farmer	Goldfield, Iowa
Bullard, Benjamin F—B L	Merchant	Forest City, Dak
Bullard, George W—B S	Architect	Springfield

NAME.	OCCUPATION.	RESIDENCE.
Carman, W B Capt -B S	Physic an	Rochester N Y
Cole, Edward E Capt	Law Student	Champaign
Curtiss, William G	Farmer	Nora
Davis, Jeptha H	Farmer	DeKalb
Eichberg, David-B L Capt	Law Student	Chicago
Eisenmayer, A J-B S Capt	Merchant	Trenton
Harrison, Samuel A-B A	Prin Pub School	Gifford
Merritt, Charles H	Teacher	Mason City
Neely, John R-B L	Government Clerk	Washington, D C
Noble, Thomas	Civil Engineer	Monterey, Mex
Orr, Robert E-B S Capt	Civil Engineer	Jefferson
Palmer, Charles W-B L	Printer	Chicago
Peabody, Arthur-B S	Architect	Chicago
Richards, George W-B S	Civil Engineer	Carthage, N M
Roberts, Charles N-B S	Draughtsman	Jefferson
Rugg, Fred D-B L	Merchant	Champaign
Sharp, Abia J-B S Capt		East Lynne, Mo
Slaudeman, Frank-B S	Supt Electric Light	Decatur
Slauson, Howard-B S	Chemist	Bloomington
Smith, Charles L-B L Capt	Law Student	Champaign
Spencer, Nelson S-B S	Architect	Beatrice, Neb
Taft, Florizel A-B S	Banker	Hanover, Kan
Todd, James-B S	Farmer	Elgin
Turner, Herbert Capt	Farmer	Campbell, Minn
Wadsworth, John G Capt	Law Student	Bloomington
Andrus, Dora A-B L	Teacher	Ashton
Avery, Kittie C-B L	At home	Omaha, Neb
Cole, Fronia R	Teacher	Champaign
Raley, Arvilla K	At home	Granville

1883.

Abbott, Edward L—B S	Bridge Construction	Havre de Grace, Md
Adams, Charles F	Naturalist	Rochester, N Y
Bogardus, C Eugene B S	At Home	Champaign
Brainard, Clarence	Civil Engineer	St Louis, Mo
Craig, William P Capt	Farmer	Champaign
Gates, Alphonso S—B S	U S Dept Mineral Surveyor	Spearfish, Dakota
Goltra, Wm F—B S Capt	Civil Engineer	Bloomington
Gray, Nelson A—B L Capt	Farmer	Thomasboro
Haven, Dwight C Capt	Law Student	New Lenox
Heath, Wm A B L	Bookkeeper	Champaign
Hewes, George C—B S	Photographer	Jacksonville
Huey, Joseph D	Bill Clerk C & A R R	St Louis, Mo
Kenower, John T—B S	Farmer	Bolivar, Mo
Lewis, Ralph D	No 170 S Peoria St	Chicago
McCune, H L—B L Capt	Ed. Bus. College Journal	Jacksonville
Moore, William D		Chatham ?
Palmer, Arthur W—B S	Ass't in Chem'l Lab., Ill Ind Univ	Champaign
Peirce, Fred D—B S Capt	Stock Farmer	Gilman

NAME.	OCCUPATION.	RESIDENCE.
Piatt, Silas H	Express Agent	Minneapolis, Minn
Scotchbrook, Geo P—B S		Morrison
Sondericker, William—B A	Teacher	Gifford
Weis, Joseph B S	Chemist, 81 Clark St	Chicago
Ashby, Lida M—B L	Teacher	Hebron, Neb
Boggs, Hattie M—B A	Teacher	Tuscola
Colvin, Mary S	Pr in Pub School	La Rose
Fellows, Clara B—B L	At Home	Millbank, Dakota
Gardner. Jessie—B L	At Home	Champaign
Healey, Grace—B L	At Home	Champaign
Knowlton, Lizzie A—B L	Teacher	Champaign
Langley, M Celeste—B L	At Home	Champaign
Lewis, C Florence—B L	Mrs C J Bills	Endicott, Neb
Peabody, Kate F—B L	At Home	Champaign
Stewart, Ella M	Teacher	Champaign
Wright, Minnie E—B L	At Home	Champaign



LEARNING AND LABOR.

CATALOGUE AND CIRCULAR

OF THE

ILLINOIS INDUSTRIAL UNIVERSITY,

URBANA, CHAMPAIGN COUNTY, ILL.

1884-85.

CHICAGO:
J. S. STOTT, PRINTER AND STATIONER.

1885.

FACULTY.

SELIM H. PEABODY, Ph. D., LL. D.,
REGENT, and Professor of Mechanical Engineering and Physics.

THOMAS J. BURRILL, M. A., Ph. D.,
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

GEORGE E. MORROW, M. A.,
Professor of Agriculture.

FREDERICK W. PRENTICE, M. D.,
Professor of Veterinary Science.

PETER ROOS,
Professor of Industrial Art and Designing.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

WILLIAM McMURTRIE, E. M., Ph. D.,
Professor of Chemistry and Mineralogy.

STEPHEN A. FORBES, Ph. D.,
Professor of Entomology and Zoology,
and STATE ENTOMOLOGIST.

CHARLES McCLURE,
SECOND LIEUT. 18TH INFANTRY, U. S. A.,
Professor of Military Science and Tactics.

JEROME SONDERICKER, C. E.,
Assistant Professor of Enginëering and Mathematics.

CHARLES W. ROLFE, M. S.,
Assistant Professor of Natural History.

ARTHUR T. WOODS,
ASSISTANT ENGINEER, U. S. N.,
Assistant Professor of Mechanical Engineering.

EDWIN A. KIMBALL,
Instructor in Iron-work, and Foreman.

GEORGE W. PARKER,
Instructor in Wood-work, and Foreman

EMMA M. HALL, M. A.,
Instructor in Ancient Languages.

MARY E. DARROW, B. A.,
Instructor in Modern Languages.

KITTIE M. BAKER, B. S.,
Teacher of Vocal and Instrumental Music.

WILLIAM W. CARNES,
Teacher of Elocution.

HOWARD SLAUSON, B. S.,
First Assistant in Chemical Laboratory.

ALBERT G. MANNS,
Second Assistant in Chemical Laboratory.

WILLIAM H. GARMAN,
Assistant in Zoological Laboratory.

GEORGE W. McCLUER, B. S.,
Foreman Horticultural Department.

A. B. BAKER,
Janitor.

LIST OF STUDENTS.

Resident Graduates.

NAME.	RESIDENCE.
Austin, James,	Altona.
Ayers, Nettie, B. L.,	Urbana.
Braucher, Arthur C., B. S.,	Lincoln.
Morgan, George W., B. L.,	Kinmundy.
Stratton, Samuel W.,	Champaign.
Wills, Jerome G., B. L.,	Vandalia.

Senior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Alfred N	Agriculture and Military	Union Grove.
Ayers, Judson F	Literature and Science	Urbana.
*Babcock, Wm A	Literature and Science	Ipava.
Barrett, Dwight H	Chemistry	La Moille.
*Bishop, John F	Architecture	Champaign.
Braucher, Wm B	Mechanical Engineering	Lincoln.
Carter, Harry L	Mechanical Engineering	Humboldt.
Cole, T Edward	Elective	Champaign.
Colton Simeon C	Civil Engineering	Chicago.
Davis, James O	Civil Eng. and Military	French Grove.
Dunlap, Robert L	Chemistry	Savoy.
Ellis, George H	Chemistry	Milwaukee, Wis.
Hicks, George L	Literature and Science	Warren.
Hopper, Charles S	Literature and Science	Bristol.
*Kammann, Chas H	Literature and Science	Mascoutah.

NOTE.—A star (*) indicates that a student has not secured the full number of credits belonging to the class in which he is enrolled. He may have fallen behind this class, or he may have advanced beyond the class below.

NAME.	COURSE.	RESIDENCE.
Kendall, William F	Civil Engineering	Rock Island.
Kent, James M	Mechanical Engineering	Kewanee.
Lantz, Milo P	Natural History and Mil.	Oak Grove.
*Latham, Ector B	Civil Eng. and Military	Atlanta, Ga.
Lattin, Judson	Mechan. Eng. and Mil.	Sycamore.
Manns, Albert G	Chemistry	Chicago.
Marshall, Sherman L	Lit. and Science and Mil.	Ipava.
Miller, John A	Chemistry	Buffalo, N. Y.
Morse, E Leland	Civil Eng. and Military	Cazenovia.
North, Arthur T	Architecture	Kewanee.
North, Foster	Natural History	Kewanee.
*Parker, William H	Literature and Science	Oswego.
*Peterson, Harry G	Civil Engineering	Champaign.
Petty, George R	Civil Engineering	Pittsfield.
Rankin, Charles H	Civil Engineering	Fall Creek.
Reynolds, Henry L	Mechanical Engineering	Camp Point.
Roberts, Vertus B	Civil Eng. and Military	Joliet.
Ronalds, Hugh L	Mechanical Engineering	Grayville.
Schleder, Theo H	Architecture	Green Vale.
Schrader, Alfred C	Civil Engineering	Joliet.
Sherrill, Frank A	Civil Engineering	Belvidere.
Smith, William H	Literature and Science	Salem.
Stockham, Wm H	Mechan. Eng. and Mil.	Chicago.
Swern, William C	Architecture	Marshall.
Vial, Fred K	Agriculture	Western Springs.
Wright, John E	Literature and Science	Champaign.
Woodworth, Chas W	Natural History	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Clark, Kate F	Natural History	Cobden.
Earle, Mary T	Natural History	Cobden.
Jones, Emma T	Literature and Science	Champaign.
Merboth, Louisa	Literature and Science	Spring Bay.
Owens, Bessie W	Literature and Science	Urbana.
Paullin, L Estelle	Elective	Atlanta.
Plank, Besse G	Literature and Science	Champaign.
Switzer, Charlotte	Literature and Science	Champaign.
Weston, Abbie	Literature and Science	Champaign.
Wills, Etta C	Elective	Vandalia.
Wright, Lizzie M	Literature and Science	Champaign.
Wright, Minnie S	Literature and Science	Plainfield.
Zeller, Josephine M	Elective	Spring Bay.

Junior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bannister, George S	Architecture	Odell.
Brown, Simon	Civil Engineering	Grant Fork.
*Bullard, S Foster	Civil Engineering	Springfield.
Chitty, William L	Literature and Science	Metamora.
†Clark, Arthur S	Architecture and Mil.	Champaign.
Cromwell, John C	Mechanical Engineering	Frankfort, Ky.
Dodds, Joseph C	Literature and Science	Sadorus.
Endsley, Lee	Literature and Science	Milford.
*Everhart, T W B	Ancient Languages	Champaign.
Fulton, James	Civil Engineering	Eureka.
Garrett, James H	Mechanical Engineering	Ashton.
Garvin, John B	Natural History	Morristown, N.Y.
Harris, James W	Civil Engineering	Blackberry.
Hubbard, Harry T	Literature and Science	Urbana.
*Jacobson, Jacob S	Architecture	Chicago.
*Johnson, Edward S	Civil Eng. and Military	Milan.
Lemme, Emil	Architecture	Davenport, Ia.
Lumley, Clinton G	Literature and Science	Ringwood.
*McGregor, Wm G	Mechanical Engineering	Chicago.
Mackay, John L	Mechan. Eng. and Mil.	Mt. Carroll.
Maxwell, Wm M	Literature and Science	Champaign.
*Millar, W Edwin	Civil Engineering	Mattoon.
Moffett, W D	Civil Engineering	Decatur.
Morse, Henry M	Mechanical Engineering	Cazenovia.
*Olshausen, W A G	Civil Engineering	Davenport, Ia.
Pease, James F	Agriculture	Quincy.
*Pence, William D	Civil Eng. and Military	Columbus, Ind.
Philbrick, Alvah	Civil Eng. and Military	Baileyville.
Plowman, William L	Literature and Science	Virden.
*Powers, Mark	Natural History	Fayetteville, Mo.
Ruhm, John J G	Chemistry	Nashville, Tenn.
*Scott, John A	Elective	Champaign.
Shlaudeman, Harry	Architecture	Decatur
*Sickels, F Henry	Literature and Science	Champaign.
Speidel, Hugo	Civil Eng. and Military	Rock Island.
*Taylor, Horace	Elective	Nokomis.
*Thompson, Luther	Civil Eng. and Military	Bement.

†Deceased.

NAME.	COURSE.	RESIDENCE.
*Waite, Merton	Natural History and Mil.	Oregon.
Whitmire, Z Lincoln	Literature and Science	Metamora.
Wilder, Henry W	Ancient Lang. and Mil.	Champaign.
*Williams, Herb't B	Mining Engineering	Farm Ridge.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayers, Belle	Literature and Science	Urbana.
*Elder, Nettie	Literature and Science	Urbana.
Ermentrout, A Mae	Literature and Science	Urbana.
Fairchild, Rozina P	Literature and Science	Metamora.
Huff, Bertie	Literature and Science	Champaign.
Jaques, Minnie	Literature and Science	Urbana.
*McClain, Mary E	Literature and Science	Urbana.
Parminter, Grace E	Literature and Science	Metamora.

Sophomore Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Barclay, William	Civil Engineering	East Wheatland.
Blake, John B	Mechan. Eng. and Mil.	Lombard.
*Braucher, Edw R	Mechanical Engineering	Lincoln.
*Bunn, Frank W	Mechanical Engineering	Sterling.
Cantine, Edward I	Civil Eng. and Military	Bloomington.
*Clark, Percy L	Chemistry and Military	Elgin.
Connet, Oliver	Civil Eng. and Military	Champaign.
*Cope, Walter L	Agriculture	Salem.
Courtney, Louis	Civil Engineering	Milford.
†Doan, Edward G	Mechanical Engineering	Champaign.
*Dose, Henry	Civil Engineering	New Athens.
*Dryer, Ervin	Mechanical Engineering	Champaign.
Edwards, Frank R	Civil Englneering	Wellington, Kan.
*Fargusson, Mark	Civil Eng. and Military	Chicago.
Fink, Bruce	Natural History	Aurora.
*Flickinger, Fred C	Civil Eng. and Military	Winthrop, Iowa.
Gilbert, Frank M	Mechanical Engineering	Bryan, Texas.
Gill, Rudolph Z	Architecture	Urbana.
Goodwin, Phil A	Civil Eng. and Military	Wilmington.

†Deceased.

NAME.	COURSE.	RESIDENCE.
Henson, Charles W	Mechanical Engineering	Chicago.
Hill, Walter A	Mechan. Eng. and Mil.	Champaign.
Lloyde, Clarence A	Mechan. Eng. and Mil.	Champaign.
Long, Frank B	Architecture	Virden.
Lyman, Henry M	Mechan. Eng. and Mil.	Lemont.
Marquis, John A	Natural History and Mil.	Monticello.
*Miles, William E	Architecture	Kewanee.
*Mitchell, Walter R	Natural History	Bement.
*Moffett, Ocea E	Literature and Science	Modesto.
Moore, Albert C	Lit. and Science and Mil.	Polo.
Peabody, Lorin W	Mechanical Engineering	St. Joseph.
*Pillsbury, Wm F	Literature and Science	Springfield.
*Prunk, Frank H	Mechanical Engineering	Indianapolis, Ind.
Richards, Albert L	Mechanical Engineering	Burton.
*Ryan, Edgar	Civil Engineering	Virden.
Sargent, Charles E	Mechanical Engineering	Carlinville.
*Scott, Archie R	Literature and Science	Champaign.
*Simons, Burton R		Oswego.
*Spear, Grant W	Mechanical Engineering	Aurora.
Spencer, James E	Mech. Eng. and Mil.	Urbana.
*Squire, Willis C	Mechanical Engineering	La Grange.
*Tatarian, Bedros	Chemistry	Constantinople, Turkey.
*Tunnell, Frank W	Chemistry and Military	Edwardsville.
*Willard, Reuel	Mechanical Engineering	Wilmington.
*Young, William F	Literature and Science	Oswego.

LADIES.

NAME.	COURSE.	RESIDENCE.
Detmers, Frederica	Natural History	Champaign.
*Eldridge, Mary A	Literature and Science	Galva.
Folger, Ida	Literature and Science	Ridge Farm.
*Gayman, Angelina	Literature and Science	Champaign.
*Jillson, Sallie R	Literature and Science	Champaign.
*Jutkins, Charlotte R	Literature and Science	Savoy.
Kimball, C Maud	Elective	Champaign.
*Mathers, Effie	Natural History	Mason City.
Neely, Kate	Literature and Science	Du Quoin.
Price, Kate C	Literature and Science	Champaign.
Terbush, Jennie M	Literature and Science	Champaign.
Williamson, Mary H	Literature and Science	Urbana.

Freshman Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Bacon, Henry Jr	Architecture	Wilmington, N.C.
Barber, William D	Mech. Eng. and Mil.	Champaign.
*Beach, Chandler	Civil Engineering	Champaign.
*Beadle, J Grant	Architecture	Kewanee.
Bing, Benjamin	Chemistry	Urbana.
Bowditch, Fred D	Lit. and Science and Mil.	Burnsville, N. C.
Bryant, William C	Architecture	Holton, Kan.
Bush, Lincoln	Civil Engineering	Palos.
*Cassell, Robert T	Literature and Science	Metamora.
Cheedle, Harry	Mech. Eng. and Mil.	Metamora.
*Coddington, Edw D	Civil Engineering	Kansas City, Mo.
Dewey, Ralph E	Literature and Science	Penfield.
Dickinson, Frank H	Literature and Science	Danvers.
Ellison, Edward E	Civil Eng. and Mil.	Marine.
*England, Chas E		Monticello.
Etnyre, Samuel L	Civil Engineering	Oregon.
Fischer, J George	Mechanical Engineering	Oregon.
Folger, Adolphus		Ridge Farm.
Frederick, Grant	Lit. and Science and Mil.	Clarence.
Gaskill, Beattie E	Chemistry	Mascoutah.
Goldschmidt, Alf'd G	Mech. Engineering	Davenport, Ia.
Goldschmidt, Ed W	Mech. Engineering	Davenport, Ia.
*Graham, Wm W	Elective	Oquawka.
*Gray, William A	Civil Engineering	Louisiana, Mo.
Grindley, Harry S	Agriculture	Champaign.
Grubb, Edwin S	Literature and Science	Springfield.
*Hadra, Fritz	Literature and Science	San Antonio, Tex.
Harrower, Walter J	Civil Eng. and Military	Barrington.
*Hoyt, C M		Aurora.
*Irving, Frank T	Architecture	Jacksonville.
Lanham, Edgar T	Literature and Science	Urbana.
*Ligare, Edward F	Civil Engineering	Glencoe.
McHugh, Geo B	Chemistry	Urbana.
*McIntosh, M C	Mech. Eng. and Military	Barrington.
*Mackay, Duncan F	Natural History	Mt. Carroll.
*McWilliams, B A	Literature and Science	Litchfield.
Meneley, Chas W	Literature and Science	Champaign.
Monroe, Geo H	Chemistry	Salem.

NAME.	COURSE.	RESIDENCE.
Myers, George W	Lit. and Science and Mil.	Urbana.
*Napper, S T	Agriculture	Scales Mound.
*Nicolet, Harry L	Literature and Science	Champaign.
Patton, Jacob A	Chemistry and Military	Charleston.
*Pease, Chester I	Mechanical Engineering	Marion.
Pickard, Edward W	Ancient Languages	Urbana.
*Piper, Charles W	Mechanical Engineering	Chicago.
*Piper, Edward D	Mechanical Engineering	Chicago.
*Powel, John F	Civil Engineering	Jerseyville.
Reese, George J	Civil Engineering	Sidney.
*Renner, Enos H	Literature and Science	Champaign.
Rinaker, John I Jr	Civil Engineering	Carlinville.
Roberts, Warren R	Civil Eng. and Military	Sadorus.
Samuels, Jonath'n H	Mech. Eng. and Military	Moline.
Sanford, Willard C	Chemistry	Marengo.
Schaefer, John V E	Mech. Eng. and Military	Granville.
*Shank, John A	Mechanical Engineering	Paris.
*Shattuck, Chas W	Civil Engineering	Champaign.
*Spencer, Newton C	Mechanical Engineering	Urbana.
*Stewart, Walter	Chemistry	Wilmington.
Strout, Edward C	Mechanical Engineering	Wilton Center.
Tannatt, Eben T	Mech. Eng. and Military	WallaWalla, W.T.
Taylor, John W	Civil Engineering	Charleston.
Tossey, Francis J	Literature and Science	Toledo.
Troyer, William L	Agriculture	Dorchester, Neb.
Vance, Boyle	Literature and Science	Paris.
VanGundy, Chas P	Literature and Science	Springfield.
*Webster, A W	Literature and Science	Poplar Grove.
*Wikoff, Frank J	Mechanical Engineering	Metamora.
*Walsh, John W	Literature and Science	La Salle.
*Walton, Clarence T	Civil Engineering	Thomasboro.
Young, Robert L	Architecture	Indianapolis, Ind.

LADIES.

NAME.	COURSE.	RESIDENCE.
Barnes, Mary Lena	Literature and Science	Champaign.
Beach, Etta L	Literature and Science	Champaign.
Bennett, Nelly A	Literature and Science	Atlanta.
*Coffeen, Amy	Literature and Science	Champaign.
Connet, Ella	Elective	Champaign.
Dewey, Helena M	Literature and Science	Urbana.

NAME.	COURSE.	RESIDENCE.
Eisenmayer, Ida	Literature and Science	Mascoutah.
Jillson, Nellie W	Literature and Science	Champaign.
McLean, Nellie	Literature and Science	Urbana.
McWilliams, M E	Literature and Science	Champaign.
*Paine, Leanah J	Literature and Science	Orizaba.
*Paine, Sarah M	Natural History	Orizaba.
Pearman, Minnie A	Elective	Champaign.
Rhinesmith Beulah	Literature and Science	Bement.
*Robinson, G M	Literature and Science	Champaign.
Stoltey, Ida M	Literature and Science	Champaign.
Walden, Lilly May	Literature and Science	Metamora.

Preparatory Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Aguilera, Rodrigo	Civil Engineering	Parral, Mex.
Aubery, James M Jr	Natural History	Chicago.
Baker, Frank D	Mechanical Engineering	Wilmington.
Bartholow, Otho F	Literature and Science	Philo.
Beadles, Charles H	Literature and Science	Bushnell.
Bell, George A	Mechanical Engineering	Cobden.
Bennett, Fred'k M	Civil Engineering	Atlanta.
Blackburn, Jas M	Chemistry	Paris.
Blakeslee, Frank A	Mechanical Engineering	Du Quoin.
Bocquet, Julius C	Literature and Science	Mascoutah.
Bodman, Winfred E		De Kalb.
Bopes, Charles	Agriculture	Hamlet.
Bowsher, C A	Civil Engineering	Barnett.
Busey, Samuel	Chemistry	Champaign.
Clark, Joseph J	Mechanical Engineering	Oak Grove.
Coen, George H	Natural History	Washburn.
Comegys, Jos P Jr		Keokuk, Ia.
Concannon, Jas C	Civil Engineering	Tolono.
Cooke, Robert J	Civil Engineering	East Newbern.
Darling, Charles B	Civil Engineering	Chicago.
Davis, Frank L	Architecture	Latham.
Evans, Rolla W	Architecture	Bloomington.
Fulton, Frank T	Agriculture	Warsaw.
Fulton, Perry A	Agriculture	Warsaw.

NAME.	COURSE.	RESIDENCE.
Galloway, Homer A	Literature and Science	Aledo.
Gilmer, John T	Civil Engineering	Coatsburg.
Golm, Julius		Quincy.
Goodell, Nathan P	Literature and Science	Loda.
Gore, Edward E	Literature and Science	Carlinville.
Grindol, John F		Decatur.
Hall, Lyman	Chemistry	Savoy.
Harrington, D S	Architecture	Lemont.
Hill, De Witt C		Latham.
Hockett, Oliver	Chemistry	Paris.
Ireland, Charles H		Washburn.
Jones, Harry	Mechanical Engineering	Parnell.
Jurado, Miguel	Agriculture	Parral, Mex.
Jutkins, Edgar M		Savoy.
Kendall, Harry F	Literature and Science	Newton.
McFerson, Grant	Literature and Science	Tonica.
McGavic, Fred O	Mechanical Engineering	Keokuk, Iowa.
Machan, George	Literature and Science	Argenta.
Manning, Chas R	Architecture	Sterling.
Miller, Horace	Chemistry	Urbana.
Miller, James M	Literature and Science	Champaign.
Miller, Lee Roy E	Elective	Mascoutah.
Moir, Alexander		Oquawka.
Moir, James		Oquawka.
Morris, John L		Bradford.
Morse, Rollin H		Gifford.
Mortland, William		Hardin.
Mueller, Adolph	Mechanical Engineering	Decatur.
Norris, Isaac H	Civil Engineering	Arlington.
Parker, Orson S		Oswego.
Patton, Fred L	Agriculture	Charleston.
Pease, Charles H	Literature and Science	Champaign.
Peoples, N J L	Architecture	Allegheny City, Pa.
Piatt, Herman	Ancient Languages	Lincoln.
Place, Raymond M	Literature and Science	Atlanta.
Porter, Charles A	Mechanical Engineering	Salem.
Robinson, Chas S	Literature and Science	Palatine.
Robison, Edgar	Agriculture	Towanda, Kan.
Roll, George W	Literature and Science	Woodland.
Schaefer, Philemon	Civil Engineering	Parral, Mex.
†Schnetz, George W	Architecture	Racine, Wis.

†Deceased.

NAME.	COURSE.	RESIDENCE.
Scovell, Frank E	Civil Engineering	Newton.
Shriver, Alonzo L	Mechanical Engineering	Champaign.
Somers, Bert S	Architecture	Beatrice, Neb.
Steele, William H	Natural History	Sullivan, Ind.
Stevenson, Benj	Natural History	Indianapolis, Ind.
Stewart, Samuel S	Literature and Science	Champaign.
Thompson, Edgar R	Literature and Science	Petersburg.
Troyer, Albert M	Agriculture	Dorchester, Neb.
Van Brunt, M G	Mechanical Engineering	Philo.
Waggoner, Lathey		Godfrey.
Wilkinson, Geo E	Literature and Science	Argenta.
Whitmire, Wm L	Literature and Science	Metamora.
Zeitinger, A F	Agriculture	Gad's Hill, Mo.

LADIES.

NAME.	COURSE.	RESIDENCE.
Bronson, Lilly O	Chemistry	Urbana.
Lane, Nannie P	Literature and Science	Mattoon.
McLellan, Mary C	Literature and Science	Champaign.
Pickard, Annie A		Urbana.
Smith, Grace C		St. Louis, Mo.
Webber, Grace		Urbana.
Wilkinson, Mary E	Literature and Science	Argenta.
Zeller, Frederica		Spring Bay.

Specials.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Alverson, Alfred G	Agriculture	Cherry Valley.
Baker, E W	Chemistry	St. Clair.
Funk, Lincoln	Agriculture	Bloomington.
Galloway, John W	Architecture	Chicago.
Jobst, Jacob	Architecture	Peoria.
Mudge, Fred A	Agriculture	Peru.
Schuricht, Karl H	Agriculture	Chicago.
Sallee, Lewis F	Natural History	York, Neb.
Seiler, Sebastian S	Agriculture	Mt. Carmel.
Waggoner, Elmer E	Architecture	Godfrey.
Woodrow, Wm L	Agriculture	Green Valley.
Young, Chas J P	Architecture	Decatur.

LADIES.

NAME.	COURSE.	RESIDENCE.
Atkinson, Mrs Rena	Art and Design	Champaign.
Detmers, Mamie	Art and Design	Champaign.
Glenn, Carrie	Art and Design	Champaign.
Hill, Addie	Art and Design	Champaign.
Jillson, Lizzie S	Art and Design	Champaign.
Lindley, May	Art and Design	Philo.
Noble, Anna	Art and Design	Todd's Point.
Rogers, Alice D	Art and Design	Urbana.
Roos, Mrs P	Art and Design	Champaign.
Scott, Eliza J	Art and Design	Champaign.
Vail, Mattie E	Art and Design.	Champaign.

SUMMARY.

By Classes.	Gentlemen.	Ladies.	Total.
Resident Graduates	5	1	6
Seniors	42	13	55
Juniors	41	8	49
Sophomores	44	12	56
Freshmen	70	17	87
Preparatory	78	8	86
Special	12	11	23
Total	292	70	362

By Courses.	Gentlemen.	Ladies.	Total.
Agriculture	21		21
Mechanical Engineering	56		56
Civil Engineering	58		58
Mining Engineering	1		1
Architecture	26		26
Chemistry	22	1	23
Natural History	15	5	20
Art and Design	.	11	11
English and Modern Languages	60	42	102
Ancient Languages	4		4
Not Specified	24	10	34
	287	69	356
Resident Graduates	5	1	6
Total	292	70	362

Illinois Industrial University.

HISTORY.

THE Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Campaign county in bonds, buildings, and farms. The State also has made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, until four Colleges, including ten distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1,954. The number graduated from the several Colleges, including the class of 1884, is 403. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1877 its exhibit at the Paris International Exposition gained a diploma and the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Campaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junc-

tion of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The country is a region of beautiful rolling praries, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantation, arboretum, ornamental grounds, and military parade grounds.

The University buildings, fifteen in number, include a grand Main Building, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house.

The Main University Building, designed wholly for public uses, occupies three sides of a quadrangle, measuring 214 feet in front and 122 feet upon the wings. The Library wing is fire proof, and contains in spacious halls the Museum of Natural History, the Library, the Art Gallery, and the Museum of Engineering. The Chapel wing contains the Chapel, the Physical Laboratory and Lecture Room, and rooms for draughting and drawing. In the main front are convenient class-rooms; on the upper floor, elegant halls for literary societies. The building is warmed by steam from a boiler-house which forms the fourth side of the quadrangle in the rear.

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler-room; a machine shop, furnished for practical use with a steam engine, lathes and other machinery; pattern and finishing shop; shops for carpentry and cabinet-work, furnished with wood-working machinery; paint and draughting rooms, and rooms for models, storage, etc. An addition built lately for a blacksmith shop, 32 by 36 feet, contains sixteen forges, with anvils and tools, and a cupola for melting iron. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also supplied with gymnastic apparatus. One of the towers contains an armorer's shop and an artillery room; the other contains a printing office and editor's room.

The Chemical Building erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 20,000 acres of well-selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and County bonds amounting to $337,000.

Museums and Collections.

THE Museum of Zoology and Geology occupies a hall 61 by 79 feet, with a gallery on three sides, and is completely furnished with wall, table, and alcove cases. It already contains interesting and important collections, equalled at few, if any, of the colleges of the West. They have been specially selected and prepared to illustrate the courses of study in the school of natural history, and to present a synoptical view of the zoology of the State.

Zoology.—The mounted *mammals* comprise an unusually large and instructive collection of the ruminants of our country, including male and female moose and elk, bison, deer, antelope, etc.; and, also, several quadrumana, large carnivora and fur-bearing animals, numerous rodents, and good repreresentive marsupials, cetaceans, edentates, and monotremes. Fifty species of this class are represented by eighty specimens.

The collection of mounted *birds* (about five hundred specimens of two hundred and forty species) includes representatives of all the orders and families of North America, together with a number of characteristic tropical forms. Many of these specimens are excellent examples of artistic taxidermy. A series of several hundred dismounted skins is available for the practical study of species.

The set of *skeletons* contains examples of all the orders of mammals and birds except Proboscidæ, together with typical representatives of the principal groups of reptiles, amphibians, and fishes.

The *cold-blooded vertibrates* are also illustrated by a very useful collection of alcoholic specimens, plaster casts, and mounted skins of the larger species, both interior and marine.

Conchology is illustrated by several thousand shells belonging to seventeen hundred species; together with alcoholic specimens of all classes and orders. The collection of Illinois shells is creditable, although partly incomplete.

The *entomological cabinet* contains about three thousand species (principally American) named, labelled, and systematically arranged. The *lower invertebrates* are represented by several hundred dried specimens and alcoholics, and by a large series of the famous Blaschka glass models.

Geology.—The geological collection comprises many of the largest and most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the mollusks, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils from Germany, and collections, suitably arranged for practical study, from this and other States, illustrate the different formations. There is a good collection of foot-prints from the Connecticut river sand-stones.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species. The recent establishment in the University of the office of the State Entomologist of Illinois makes availble to students of this subject the entomological library and the collections of that office, and affords an extraordinary opportunity for observation of the methods of work and research in economic entomology.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of the grasses and sedges. There are, besides, many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees and shrubs of Stephenson County, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized; these, with a complete set of imported models, fully illustrate crystallography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

A series of standard weights and measures has been received from the office of the Coast and Geodetic Survey of the United States Government, and may be consulted at the Physical Laboratory.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, shaper, milling-machine, drill presses, and the requisite hand tools, benches, vises, anvils, etc., for pattern-shop, blacksmith-shop, moulding-room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the workshops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, illustrating sections of mines, machinery for elevating and breaking ore, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61 x 79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture, it embraces thirteen full-size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of pecular fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

Museum of Engineering and Architecture.—A large room is devoted to the gathering of a museum of practical art, the materials for which have been constantly accumulating in the various schools of science. It will contain full lines of illustrations of the work of the shops; models made at the University and purchased abroad; drawings in all departments; patent-office models, etc.; samples of building materials, natural and artificial; with whatever may be secured that will teach or illustrate in this most important phase of University work.

A notable feature of this collection is the gift of Henry Lord Gay, Architect, of Chicago. It consists of a model in plaster, and a complete set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first King of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was to have been seven and a quarter millions of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for political reasons. Mr. Gay's generous gift occupies the place of honor in the Museum of Engineering and Architecture.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 14,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading-room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study is encouraged or required. The reading-room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received:

PERIODICALS IN THE LIBRARY, 1885.

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Country Gentleman.
Breeder's Gazette.
Indiana Farmer.
New England Farmer.
Michigan Farmer.
Farmer and Fruit-Grower.
Iowa Homestead.
Agricultural Gazette, *London.*
Gardeners' Chronicle, *London.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal, monthly and weekly.
Horticulturist.
Farmers' Review.
Veterinary Journal.
Industrialist.
Poultry Keeper.
Farm, Field and Stockman.

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Builder, *London.*
American Engineer.
Transactions American Society of Civil Engineers.
Engineering News.
Engineering and Mining Journal.
Scientific American.
Scientific American Supplement.
Sanitary Engineer.
Van Nostrand's Engineering Magazine.
The Workshop.
American Architect.
American Machinist.
Western Manufacturer.
Gazette of Patent Office.
Mechanics.
Locomotive.
American Artisan.

SCIENTIFIC

Botanique.
Annales des Sciences Naturelles, Botanique, *Paris.*
Annales des Sciences Naturelles, Zoologie, *Paris.*
Science.
Nature, *London.*
American Naturalist.
Grevillea, *London.*
Journal of Microscopical Science.
Decorator and Furnisher.
Art Amateur.
Portfolio, *London.*
Comptes Rendus, *Paris.*
Chemical News, *London.*
Journal of Chemical Society, *London.*
American Journal of Chemistry.

Boston Journal of Chemistry.
Jahrbericht der Chemie, *Giessen.*
Zeitschrift fur An Chemie.
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
Journal of Franklin Institute.
Journal de Mathematiques.
Mathematical Quarterly.
Annals of Mathematics.
Monthly Weather Review.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review.
Contemporary Review.
Fortnightly Review.
North American Review.
Atlantic Monthly.
Century.
Dial.
Literary World.
American Journal of Education.
Education.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Musical Record.
Signal.
The Rock-Islander.
Country and Village Schools.

The exchanges of the *Illini* are also free to the students in the Library.

Aims of the University.

THE University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and profession in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its

Colleges from the older Institutions of this country. It embraces four Colleges, which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture. School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.
School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music, and Elocution are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required:—that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

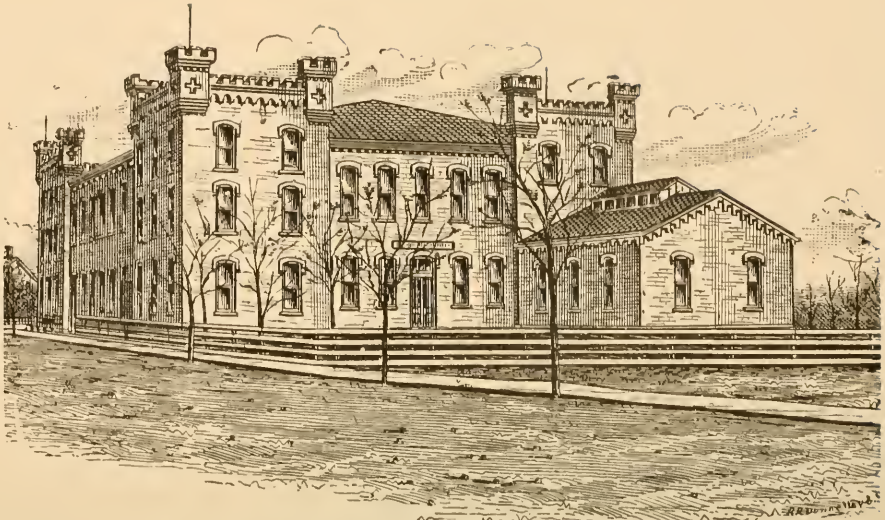
Physics, Chemistry, Mineralogy, Physiography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and Designing, Elements of Construction, Graphical Statistics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, on the two days, previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical qualities; Geometry, plain and solid. These are required also for all the Colleges.



DRILL HALL AND MACHINE SHOP.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and Composition. These are required, in addition to the subjects specified in 1 and 2, for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy; Latin Grammar and Reader, Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition in addition to the subjects of 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges ; also "*Preliminary Year.*"

COUNTY SUPERINTENDENT'S CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches, Arithmetic, Geography, English Grammar, and History of the United States; applicants who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

College of Agriculture.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean.
PROFESSOR BURRILL,
PROFESSOR PRENTICE,
PROFESSOR McMURTRIE.
PROFESSOR FORBES.

ADMISSION.

CANDIDATES for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and na-

ture of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming," but a knowledge of the real nature of all true farming —of the great natural laws of the farm and its phenomena— this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; laws especially affecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: orchard sites; the age of trees to plant; the season to plant; how to plant; what to plant; the management of the soil; pruning and care of trees; gathering and preserving fruit; disease and injuries; the nursery; ornamental trees and shrubs; flower gardens ; vegetable gardens including propagating beds and houses; the vineyard and small fruits, and timber tree plantation. Students have instruction and practice in grafting, building, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root grafts of apples.

Landscape Gardening.— Lectures are given upon the general principles of the art, the history and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the school. Excursions are made when found practicable, for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for special horticultural pursuits, and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which causes or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and

value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the aboretum, afford practical illustrations.

Plant-Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the domestic animals is taught by lectures, demonstration and dissections. Post-mortems of healthy and diseased animals are made, so that the students may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge for the instruction of the students. Lectures are given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the agricultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines, their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and special investigations by each student. A Thesis is required embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorology, see statements in *College of Natural Science.*

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc., also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, Berkshire and Poland China Swine, and Shropshire-down, South-down and Cotswold Sheep to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture under the direction of the Professors of Agriculture and Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the hill-side barn. The barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large windmill which furnishes power for grinding feed, and for other purposes.

A veterinary hall and stable have been provided, and a clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier-mache* models of the foot and the teeth of the horse at different ages.

Surveying and drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College, there are: 1.—A very large specimen apple orchard planted in 1869, and containing about 1,000 varieties—many varieties of pears, cherries, grapes, and small fruits. 2.—A nursery of young trees, in which students have regular work in propagation, etc. 3.—A forest-tree plantation embracing the most useful kinds of timber. 4.—An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different materials and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College has a supply of compound microscopes and apparatus, and students have opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture; Chemistry; Trigonometry, Shop practice (optional).
2. Elements of Horticulture; Chemistry; British Authors, or Free Hand Drawing.
3. Economic Entomology; Chemistry; Rhetoric.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Botany; German.
2. Agricultural Chemistry (Soils and Plants), Zoology or Botany; German.
3. Agricultural Chemistry (Tillage, Fertilizers, Foods); Vegetable Physiology; German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; German.
2. Animal Husbandry; Veterinary Science; Veterinary Materia Medica (optional extra); Physics or Geology.
3. Landscape Gardening; Veterinary Science; Physics or Geology.

FOURTH YEAR.

1. Physiography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 36 and 37.

FARMER'S COURSE.

Students who have not the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Economic Entomology or Landscape Gardening.

College of Engineering.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean;
PROFESSOR SHATTUCK,
PROFESSOR SONDRICKER,
PROFESSOR BAKER.
PROFESSOR WOODS.
MR. KIMBALL.
MR. PARKER.

SCHOOLS,

MECHANICAL ENGINEERING, ARCHITECTURE,
CIVIL AND MINING ENGINEERING.

ADMISSION.

APPLICANTS should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text book, and the drawings made on smooth paper, eight by ten inches.

STUDIES PURSUED BY ALL ENGINEERING STUDENTS.

The subjects common to all the schools in the College of Engineering will be described first; the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

Advanced Algebra.—Functions and their notation ; series and the theory of limits; imaginary quantities; general theory of equations.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an are, plane area, surface and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc., algebraic curves.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; the point, right line, plane, and surfaces of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables ; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications; elements of elliptic integrals.

PHYSICS.

The course of Physics embraces the kind of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are more effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for neat and molecular physics from J. Salleron, of Paris; for light optics, and electricty from Stoehrer of Leipsic, and Browning and Newton of London; pneumatic and electrical apparatus from E. S. Ritchie of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Bros., London, resistance coils, galvanometers, etc., for higher researches in electricity.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of discriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective; drawing of machines, bridges, roofs, etc., finished by line shading, tints, and colors.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering.—Plain and ornamental alphabets; titles and title-pages; round and stump writing.

Descriptive Geometry.—Problems on the point, right-line and plane; warped surface; perspective; shades and shadows; practical problems.

APPLIED MATHEMATICS.

Analytical Mechanics.—Polygon of forces; equations of eqilibrium of moments; center of gravity; moment of inertia; acceleration, work, momentum, impact; motion of free particles; central forces; constrained motion.

Strength of Materials.—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Hydraulics.—Amount and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises :

For manuscripts and unimportant drawings, a heavy flatcap paper.

For ordinary drawings, not colored, a heavy, first-quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings, and lettering, the best three-ply Bristol board. For problems, exercises, lecture notes, theses, and other manuscripts, and for geometrical projection, topographical, railroad, typographical, and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used, it must be cut 8x10 inches, and the binding margin hinged on with muslin.

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink or colors. It must be upon regulation paper, and securely bound. It will be prepared during the latter part of the fourth year, and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings,

perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labelled with donors' names, and placed in the Museum of Engineering and Architecture, for the inspection of students and the illustration of lectures.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory, is counted as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and by text books. Examples are given showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and

the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents five different shops, viz.:

1—Pattern Making.
2—Blacksmithing.
3—Foundry Work.
4—Bench Work for Iron.
5—Machine Tool Work for Iron.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern-making. Patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, the process of moulding and casting are fully illustrated.

In the 4th, there is first a course of free-hand bench work, the cold chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 5th shop the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Previous to the shop work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a sys em of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact, cams and curves in sliding contact; gear teeth; gearing chains; escapements; link work.

Prime Movers.—The theory and useful effects of turbine water-wheels, and best form of the parts for high efficiency. Other water-wheels and wind-wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill-Work and Machinery.—Trains of mechanism studied with reference to their resistance and efficiency; best forms for transmission of power for short or great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

The steam-engine, large drill-press, one engine lathe, the hand lathes, and the milling-machine, now in use, were designed here, and built in the shop, by students in the department.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the Mechanical Laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop, furnished with complete sets of tools, benches, vises, and forges, with flasks for moulding in sand, and cupola for melting iron.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; German or French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; German or French.
3. Advanced Algebra; Free Hand Drawing; Shop Practice; German or French.

SECOND YEAR.

1. Calculus; Designing and Construction of Machines; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German or French.
3. Advanced Calculus; Astronomy; German or French.

THIRD YEAR.

1. Mechanism; Advanced Descriptive Geometry; Chemistry.
2. Analytical Mechanics; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Engineering Materials; Physics.

FOURTH YEAR.

1. Prime Movers; Resistance of Materials and Hydraulics, Mental Science.
2. Prime Movers; Construction Drawing; Constitutional History.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of either French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text books, and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking

many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid interference of hours of recitation and because the studies are there given in the order which best meets the preparation of the student.

TECHNICAL STUDIES.

Astronomy.—Descriptive Astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the altazimuth instrument, the astronomical transit, the sextant, and the engineer's transit adapted to astronomical calculations. It includes the instrument and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges.—Calculations of stresses in the various forms of bridge trusses, by algebraic and graphical methods, consideration being given to weights of bridge and train, and force of wind; designing trusses and proportioning sections; details.

Geodesy.—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; projection of maps.

Land Surveying.—Areas and distances, by chain, compass, and plane table; omissions and corrections; metrical system; methods of U. S public land surveys; magnetic variation; determination of true meridian.

Railroad Surveying.—Economic location; curves and grades, and their inter-adjustment; earth-work; curvature and elevation of rail; easement curves; turnouts; crossings; maintenance of way.

Stone Work.—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topography.—Use of stadia, plane-table, and level; contours; soundings. Sketching, mapping, conventional signs; city and county maps.

Theory of Engineering Instruments.—Examination of workmanship and design; testing instrument-maker's adjustments; engineer's adjustments; determination of areas with transit; inaccessible and air line distances; profiles; heights and distances with stadia; measurement of angles with sextant, etc.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane-table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topographical survey of a locality is made by the class, in which the stadia and plane-table are used as in the United States surveys.

In the fall term of the third year the class will execute a project in railroad engineering, which will consist of preliminary surveys, location, staking out, drawings, computations of earth work, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice.—The school is well provided with the instruments necessary for the different branches of engineering field practice, which includes, chains, tape, compass, plane tables, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observation. An astronomical observatory is provided with an equatorial telescope, an astronomical transit, with attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton &

Simms of London, is used for instruction in Geodesy and Practical Astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying, are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photolithographs of bridges, roofs, and engineering structures; it has access to the Museum of Engineering and Architecture, which contains models illustrating wood, stone, and metal construction, and to a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The Library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French or German,
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French or German.
3. Advanced Algebra; Free-Hand Drawing; Shop Practice; French or German.

SECOND YEAR.

1. Calculus, Land Surveying; French or German,
2. Advanced Analytical Geometry; Surveying and Theory of Instruments; French or German.
3. Advanced Calculus; Topographical Surveying and Drawing; French or German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry; Railroad Engineering.
2. Analytical Mechanics; Chemistry; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geodesy and Practical Astronomy*; Mental Science.
2. Bridges*; Stone Work; Constitutional History.
3. Geology; Bridge Construction*; Political Economy.

MINING ENGINEERING.

Students in Mining Engineering will take a course in Metallurgy (see School of Chemistry) in place of the studies marked with a * as above. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores, and rocks. In the Chemical Laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces, and other apparatus required for practical instruction in this department.

In each of these courses the student will take two years of German or French, but not one year of each.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory has the following position:
Latitude, 40° 6' 29" 66.77.
Longitude, West of Washington, 11° 10' 37 5", or 44m. 42.5s.
Elevation above sea-level, 720 ft.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The school prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

The course embraces the knowledge of theory and principles of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with reference to text books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed; also

models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

TECHNICAL STUDIES.

Elements of Drawing—Lectures; designs for specified problems; outline sketches and finished drawings from casts in pencil, crayon, and charcoal.

Wood Construction—Frames, roof, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction—Materials, mortars and cements, walls, foundations, stone cutting, tools and mode of using.

Brick Construction—Materials, bonds, walls, arches, vaults, and domes, centerings, etc.

Iron Construction—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating and Plastering.

Sanitary Construction—Scientific principles and practical methods employed in plumbing, water supply, and drainage of buildings.

Architectural Drawing—Finishing in line, ink, sepia, and color; working out from sketches full sets of drawings for buildings; practical perspective; shades and shadows.

Architectural Designing—Original sketches for specific projects; one full set of drawings for buildings for specified private or public purpose.

History of Architecture—Daily lectures and recitations on principal styles, their characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracing of details; designs for special problems.

Esthetics of Architecture—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration internal and external; treatment of floors, walls, ceilings; art objects, furniture, carpets, etc. About twenty-five original designs for specified objects.

Estimates—Methods of measurement; cost of labor and materials; estimates for specified works.

Agreements and Specifications—Preparation of sets.

Heating and Ventilation.—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products. Problems and applications to specified buildings.

Graphical Statics.—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such plates must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term.—Carpentry and Joinery. Planing flat, square, and octagonal prisms and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; miter, lap, and gained joints; through and lap dovetails; mouldings, miters, and panels.

Second Terms.—Turning and cabinet making; cylinders, balusters, capitals and bases of columes, vases, rosettes, etc.; fret sawing, plain and ornamental veneering; inlaying, carving, and polishing.

Third Term.—Metal work, pattern making, moulding and casting, filing and finishing, drilling, screws, hand and machine turning.

Stone work executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof trusses and stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws; planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

BUILDER'S COURSE.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making).

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Advanced Algebra; Graphical Statics; Shop Practice; French.

SECOND YEAR.

1. Elements of Wood Construction; Calculus; Free Hand Drawing and Modeling.
2. Elements of Stone, Brick, and Metal Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Elements of Sanitary Construction; Advanced Calculus; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Advanced Descriptive Geometry; Chemistry.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture; Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing; Heating and Ventilation; Constitutional History.
3. Architectural Designing; Estimates, Agreements, and Specifications; Political Economy.

College of Natural Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR BURRILL, Dean,
PROFESSOR PRENTICE,
PROFESSOR McMURTRIE.
PROFESSOR FORBES,
PROFESSOR ROLFE,
MR. SLAUSON.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

ADMISSION.

CANDIDATES for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in the course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

The first term of the first year is occupied by text-book instruction, lectures, and experiments in the laboratory, illustrating the elementary principles of chemistry, chemical physics, and inorganic chemistry. The second term is devoted

to laboratory practice in qualitative analysis. In the third term recitations upon organic chemistry and illustrative synthetic experiments alternate with laboratory practice in qualitative analysis. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required, at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Text Books.—Roscoe's Chemistry; Remsen's Organic Chemistry; Fresenius' Analysis; Bolton's Analysis; Sutton's Volumetric Analysis; Bunsen's Gasometry; Rickett's Assaying; Gore's Electro-metallurgy; Johnson's How Crops Grow and How Crops Feed.

Books of Reference.—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Roscoe and Schorlemmer's Treatise on Chemistry; Armstrong's Miller's Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poisons.

Deposits.—At the beginning of each term of Laboratory practice, each student will deposit eight dollars with the business agent of the University. At the end of the term, the balance left, after deducting payment for gas, chemicals, and apparatus used, will be refunded.

Five courses of laboratory work have been arranged, as follows:

CHEMICAL COURSE.

FIRST YEAR.

First Term.—General, theoretical and applied chemistry. Lectures, text-book, and experiments.

Second Term.—Qualitative analysis begun; tests and separation of the bases and acids.

Third Term.—Qualitative analysis completed. Examination of 20 simple salts and 20 compound substances, natural and commercial products. Organic chemistry. Text-book and recitations.

SECOND YEAR.

First Term.—Quantitative analysis of barium chloride, sodium phosphate, Rochelle salt, calcite, ammoniumferric sulphate. Volumetric analysis. Acidimetry and alkalimetry.

Second Term.—Quantitative analysis. Limestone, clay, spathic iron ore, calamine, copper pyrites, tatrahaedrite. Volumetric analysis of iron, zinc, etc.

Third Term.—Advanced organic Chemistry. Ultimate organic analysis. Determination of carbon, hydrogen, nitrogen, chlorine, phosphorus, and sulphur, in carbon compounds.

THIRD YEAR.

First Term.—Advanced Organic Chemistry, continued. Organic Synthesis and Analysis. Preparation of Carbon compounds, and determinations of composition and formulas.

Second Term.—Assaying, Dry assay of gold, silver, lead, and tin ores. Volumetric assay of silver, lead, copper and zinc ores, bullion, etc. Blow pipe assays of silver ores.

Third Term.—Analysis of Soil. Valuation of commercial fertilizers —phosphates, nitrogenous matters and alkaline salts. Analysis of milk, butter, corn and wheat. Examination of alcoholic liquors.

FOURTH YEAR.

First Term.—Gas Analysis. Calibration of eudiometers. Analysis of air from lungs, atmospheric air, marsh gas, crude coal gas. Analysis of mineral water. Preparations.

Second Term.—Toxicology. Micro-chemistry of Poisons. Testing for mineral and vegetable poisons. Separation from organic mixtures. Preparations.

Third Term.—Original researches. Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in chemical course,

Second Term.—Quantitative analysis of commercial drugs, bismuth subnitrate, tartar emetic, lodinum bicarbonate, potassium iodide, sodium bromide, ammonium carbonate, potassium nitrate, cream tartar, phosphites. Volumetric determination.

Third Term. Same as in chemical course

THIRD YEAR.

First Term.—Same as in chemical course, substituting preparation and analysis of organic chemicals for analysis of urine.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs,—oils, resins, gums, olkaloids, glucosides, etc.

Third Term,—Materia Medica. Reading and compounding perscriptions. Preparation and valuation of tinctures and extracts. Examination of commercial organic drugs.

FOURTH YEAR.

First Term.—Analysis of urine, normal and pathological. Mineral waters. Examination of alcoholic liquors.

Second Term.—Toxicology. Micro-chemistry of poisons. Separation of poisons from organic mixtures.

Third Term.—Original researches. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

Arranged for students desiring to make a specialty of this branch.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative analysis of barium chloride, magnesium sulphate, ammonium sulphate, calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term.—Analysis of ashes of plants, soil, mineral waters.

Third Term.—Analysis of commercial fertilizers, manures and mineral used for manures, apatite, phosphates, guanos, nitrates.

THIRD YEAR.

First Term.—Same as in chemical course, omitting analysis of urine. Analysis of corn, wheat, and fodder.

Second Term.—Analysis of milk, butter. cheese. Analysis of sugars by polariscope and by titration. Examination of alcoholic liquors.

Third Term.—Original researches.

COURSE IN AGRICULTURAL CHEMISTRY.

Especially arranged for students in the School of Agriculture.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course,

Second Term.—Analysis of soil, ashes of plants, commercial fertilizers, manures, and materials employed in their production,—apatite, phosphates, guanos, animal matters, ammonia salts, nitrates, and marls.

Third Term.—Analysis of corn, wheat, hay, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Assaying.* Same as in Chemical course.

Third Term.—Analysis of calamine, spathic iron ore, magnetic iron ore, copper pyrites, galena, nickel ore, manganese ore, cinnabar, grey antimony.

THIRD YEAR.

First Term.—Analysis of slags from copper, zinc, and lead; iron furnace and mill slags.

Second Term.—Analysis of pig iron, wrought iron, steel, commercial copper, lead, zinc, bullion.

Third Term.—Analysis of fuels, wood, anthracite and bituminous coals, coke, determination of heating power. Analysis of ashes and furnace cinders; mineral waters.

APPARATUS.

The facilities offered for obtainining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected, at an expense, including furniture, of $40,000.

The basement contains a furnace-room for assaying and metallurgical operation; a mill-room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture-room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accomodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood, gas, and water. There are a spectroscope table, a blow-pipe table for general use, and a store-room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing eight chemical balances of the manufacture of Bunge, (short beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with

*Students who take this term's work must have had a term of Mineralogy.

shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, an induction coil, battery, mercury, etc.; and a store-room with apparatus for all kinds of work in quantiative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of aeometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen and a potassium dichromate battery; a galvanometer; a spectroscope; microscopes; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry, General and Applied; Trigonometry; American Authors or French.
2. Chemistry and Laboratory Practice; Conic Sections; British Authors or French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

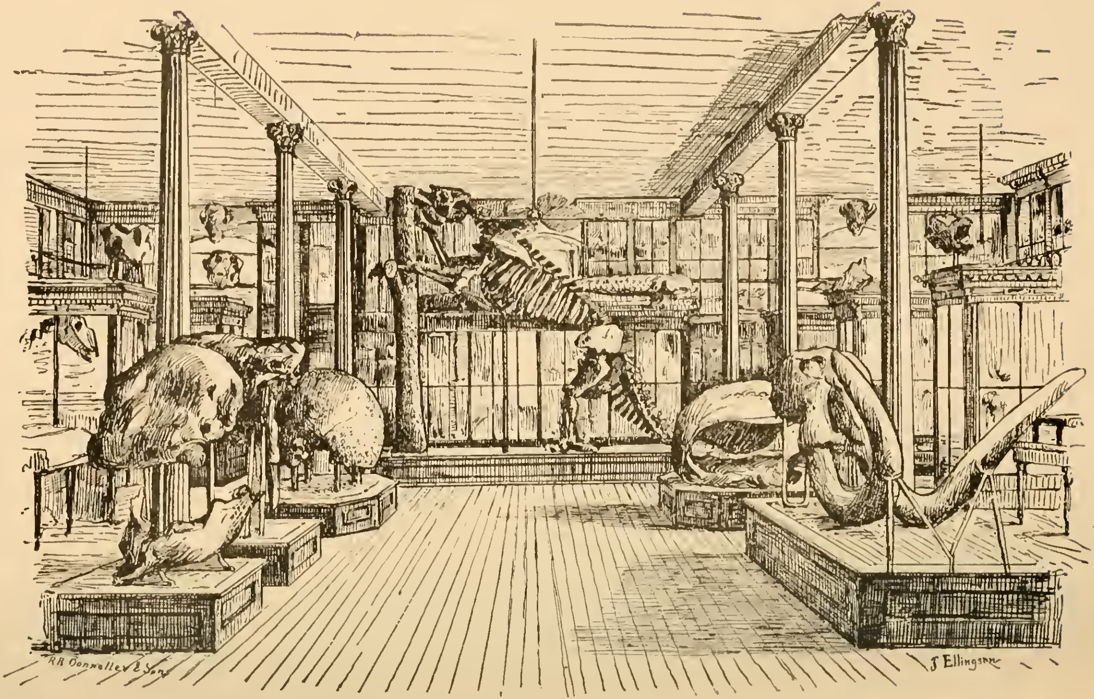
1. Chemistry and Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry and Laboratory Practice; Microscopy; German.
3. Agricultural Chemistry and Laboratory practice; Vegetable Physiology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

Laboratory Practice; Mental Science; Physiography.
Laboratory Practice; Constitutional History; Logic.
Laboratory Practice; Political Economy; Geology.



MUSEUM.

Students who are candidates for the degree of B. S. in the school of chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

A term of Photography will be provided for students who desire it; it will consist of text-book work, with recitation and daily practice.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the Sophomore year, systematic and structural Botany is continued by recitations, illustrated lectures and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the Laboratory. Each Student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's) and Bessey's Botany are required. Before using the compound miscroscopes and other apparatus furnished by the University, a deposit of three dollars is required, but no charge is made except for damage and material used. The first half of the term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance; etc., together with a history of a few special plants and their products. During this time, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramineæ, etc., especially such as are best obtained in Autumn. During the last half of the term the general morphology of plants, includ-

ing vegetable anatomy and histology, is studied, practical laboratory work being the basis of the instruction. Tests are made from time to time by the use of disguised vegetable substances.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied.

The most important books of reference in the English language are Sach's Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cooke's Fungi and Handbook of British Fungi.

Vegetable Physiology is studied in the third term. The instruction is given by lectures and experimental practice. The work includes:—the food of plants and its absorption and assimilation; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.; processes, peculiarities, and results of growth; relations and effects of temperature, light, gravitation, etc.; self and cross fertilization, relation of plants and insects; movements, "sleep of plants," tendrils; climbing vines, etc.; origin and development.

Throughout the course the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authorities for the facts stated.

Microscopy.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly but not exclusively devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skilful and rational use of the instrument and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn-tables, etc., are furnished by the University.

Anatomy and Physiology.—This subject is presented during the first term of the Junior year. Anatomy is taught by lectures illustrated by skeletons, manikin, models in *papier-mache*, and microscopical preparations. Fresh specimens of various organs are dissected and demonstrated before the class during the term. Physiology is taught by lectures, demonstrations, and recitations from Martin's treatise, The Human Body.

The library contains many of the best books of reference, including works on Anatomy by Gray, Holden, Quain, Ellis, and Morton; and on Physiology by Flint, Dalton, Kuss, McKendrick, Kirk, Draper, and Marshall.

Zoology.—The object of the Zoological course is primarily to give the students command of the methods of Zoological reseorch and study, and to derive from these their distinctive discipline. The subject is taught during the whole of the Sophomore year, the course being varied throughout on individual work in the Zoological laboratory and in the field. The results thus arrived at are supplemented by lectures and demonstrations and by the study of text.

The first term is devoted to comparative dissections of types of the great groups, and to a study of the subkingdoms and classes of animals; the second term to comparative histology and the elements of embyology,—both based on individual work with the microscope;—and the third, to the determination and description of species, to the study of life histories, and to collection, field observations, and laboratory experiments, the course closing with lectures and discussions, final generalizations and fundamental principles of Zoological science.

The natural history students electing a Zoological subject for their term's work in "natural history laboratory," in the senior year, are furnished all necessary appliances for the pursuit of whatever subject they may select, as a piece of original work, with such guidance, oversight, and suggestion as each may seem to require.

Geology is taught during the second and third terms of the junior year. LeConte's Geology is used as a text-book. The first term is given to instruction upon the dynamical effects of water in eroding, transporting, and depositing materials; upon the action of heat as manifested in metamorphism, crystalization, consolidation, and the production of mountain folds; upon the nature and material of rocks, veins, dykes,

etc., and upon the arrangement and distribution of metals and their ores. The second term is devoted to the consideration of the hisioric development of the earth as revealed by the study of the animals and plants entombed therein; and to a discussion of the elements of time, the system of life, the origin of species, and the antiquity of man.

Osteology and Taxidermy are taught in extra classes.

Physiography, or "the study of nature," is taught by illustrated lectures during the first term of the Senior year. The subjects considered are: the origin of the earth, and its relation to other worlds; the distribution of land and water; the direction and extent of mountain chains and of ocean currents; the influences which determine the climate of any locality; the systematic distribution of animals and plants; and especially the biological position of man, and his relation to the animate and inanimate worlds around him. Anthropology is taught as a distinct part of the term's work; for this a text book is used.

Entomology.—The study of Entomology, pursued during a single term of the Freshman year, is necessarily made largely empirical and practical, the subject to which it is principally directed being the place of the insect world in the general system of organic life; and, incidentally to this, the relations of insects to the interests of man.

The foundation for a knowledge of structural Entomology is laid by the discussion and detailed study of a typical insect; and for that of the orders, by a generalization of the characters of selected groups of specimens representing each.

A large part of the time is devoted to the study of the characters, life histories, habits, and economic relations of one hundred species of especially important insects. Specimens of these in their different stages, together with synopses and descriptions of the families to which they belong, are furnished the students, and the essential facts not discoverable by direct observation, are given in lectures or acquired by study of text.

Practice in field observations is given as opportunity offers, and all are taught the ordinary methods of the collection, preparation, and care of specimens, together with the approved methods of controlling the ravages of the injurious species. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school.

Beside the collections, apparatus, and entomological library of the University, the students in this course have access to the collections and library of the State Entomologist, and the practical use of the many thousand duplicate insects belonging to the office. In the field and laboratory operations of the office, an extraordinary opportunity is afforded competent students of this course to observe and assist in practical entomological work and original research.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blow-pipe. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The greenhouses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by the law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has twenty compound microscopes, four different styles from Europe, instruments by all prominent American makers, and others of which the glasses were made to order in Europe, and the stands manufactured in the shops of the University.

Zoology.—The Museum is particularly fortunate in its collections in Zoology possessing, in mounted specimens or skele-

tons, nearly all the ruminants of North America, and representatives of all orders of mammals except Proboscidæ; exhibiting fifty species by eighty mounted specimens, with numerous skeletons. In birds it represents all the families of North America, having two hundred and forty species, represented by over four hundred specimens. Its Articulates number more than three thousand specimens; its fishes, four hundred; its radiates, three hundred, and its reptiles nearly one hundred. Sea, land, and fluviatile shells are represented by seventeen hundred species. The Museum also contains nearly one hundred specimens, representing the osteology of vertebrates; a large collection of the nests and eggs of birds; a collection of Indian implements; and a manikin, a dissected eye, and a trachea, in *papier mache.*

Geology.—The Geological Cabinet contains Prof. Ward's celebrated college series of casts of famous fossils, including the gigantic Megatherium nearly eighteen feet in length; the Elephas Ganesa with tusks ten-and-a-half feet long; the Collossochelys Atlas,—a gigantic tortoise with a shell eight feet by six; and the Plesiosaurus Cramptoni, twenty-two and a half feet. It also contains a series of tracks in the sandstone of the Connecticut river; a large collection of carboniferous ferns from the celebrated locality at Morris, Ill.; several thousand specimens of fossils from the State Geological Survey, and from purchase in Europe; and a large number of specimens illustrating building materials, dikes, veins, metamorphism, drift bowlders, etc.

Mineralogy. —The Cabinet of Minerals consists of a valuable and extensive collection of the leads of the State, and accompanying mineral; a collection of models, comprising the most important forms, and combinations in the various systems of crystallization; and a very complete collection of minerals, both American and foreign.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S., in School of Natural History.

FIRST YEAR

1. Chemistry; Free-Hand Drawing, (optional); Trigonometry; French.
2. Chemistry; Free-Hand Drawing, (optional); Conic Sections; French.
3. Chemistry or Free Hand Drawing; Economic Entomology; Rhetoric; French (extra).

SECOND YEAR.

1. Zoology; Botany; German.
2. Zoology; Botany; German.
3. Zoology; Vegetable Physiology; German.

THIRD YEAR.

1. Anatomy and Physiology; Mineralogy; German; Ancient History (optional, extra.)
2. Geology; Physics; German, Mediæval History (optional, extra).
3. Geology; Physics; Modern History.

FOURTH YEAR.

1. Physiography; History of Civilization; Mental Science.
2. Microscopy; Constitutional History; Logic.
3. Natural History Laboratory Work; Astronomy; Political Economy.

In this course three terms of University Latin will be accepted in lieu of three terms of French; and five terms of such Latin for five terms of German.

College of Literature and Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean;
PROFESSOR PICKARD,
MISS E. M. HALL,
PROFESSOR SHATTUCK,
PROFESSOR CRAWFORD,
MISS M. E. DARROW.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

CANDIDATES for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the School of Ancient Languages will be examined in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody (Harkness', or Allen and Greenough's); Latin prose composition (forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 196, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's,) Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and dipthongs, and pronounciation according to the accent, are recommended.

OBJECTS OE THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, and professors, in their special departments, require a knowledge of the ancient, as well as of the modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through the Schools to provide for this important part of its mission—the furnishing of teachers to industrial schools of the country, and investigators and writers for the arts.

INSTRUCTION.

The plan of instuction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, and other work intended to illustrate the studies pursued, and to exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes

are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of, practice in English Composition should be mentioned THE ILLINI, a semi monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with a requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over fourteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on pages 28 and 29.)

SUBJECTS COMMON TO THE SCHOOL OF THIS COLLEGE.

MATHEMATICS.

First Term.—Trigonometry, plane and spherical; fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; angles as functions of sides, and sides as functions of angles; applications.

Second Term.—Conic Sections, geometrical method. Definitions and general properties of the ellipse, hyperbola, and parabola; curvature of the conic sections. Analytical Geometry, elements of. Properties and relations of the point and right line in a plane; of the conic sections.

Third Term.—Advanced Geometry; Modern Geometry. Harmonic proportion and harmonic pencils; anharmonic ratio and involution; poles and polars in relation to a circle; the radial axes and centers of similitude of two circles; the principle of continuity; elementary principles of projection.

Text Books.—Coffin's Conic Sections and Analytical Geometry; Mulcahy's Modern Geometry.

PHYSICS AND ASTRONOMY.

For these subjects, see College of Engineering.

NATURAL SCIENCE.

See College of Natural Science.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the Junior and Senior years of the University Course.

JUNIOR YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; European Geography.

SENIOR YEAR.

Constitutional History of England and the United States; History of Civilization; Analysis of Historial Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers and are therefore confined to the Senior year of the University Course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful condition of thought, growth and decay of mental and moral powers. Philosophy of education, theory of conscience; nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and the formation of the habits of thinking and common judgment of life.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical languages. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read an entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts, or original compositions on themes assigned, are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on poetry; epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the Senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German, and to Philology. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. Constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage in linguistic culture is gained by the student. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition, and conversation.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia; French; Trigonometry.
2. British Authors or Livy; French; Conic Sections.
3. Rhetoric; French; Advanced Geometry, or Free-Hand Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology or Botany.
2. English Classics; German; Zoology or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History.
2. German; Physics; Mediæval History
3. German; Physics or Chemistry; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. Early English; Logic; Constitutional History.
3. Philology; Political Economy; Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the school of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year Ancient History is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for the students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Odyssey and prose composition; Conic Sections.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Advanced Geometry.

SECOND YEAR.

1. Satires of Horace; Thucydides or German; Physiology.
2. Terence; Sophocles or German; Zoology.
3. Tacitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. Mental Science; History of Civilization; Physiography.
2. Logic; Constitutional History; Early English.
3. Political Economy; Philology; Geology.

Additional Schools.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR CHARLES MCCLURE,
2ND LIEUT. 18TH INFANTRY, U. S. A.

BY the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the Preparatory year and of College classes of the first, second and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc,
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice
Guard and Picket Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is under the charge of Lieut. Charles McClure, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery,

No student is eligible to the military class till he has reached the third term of the Freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing, in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, araanged as far as possible so as not to interfere with any other course of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

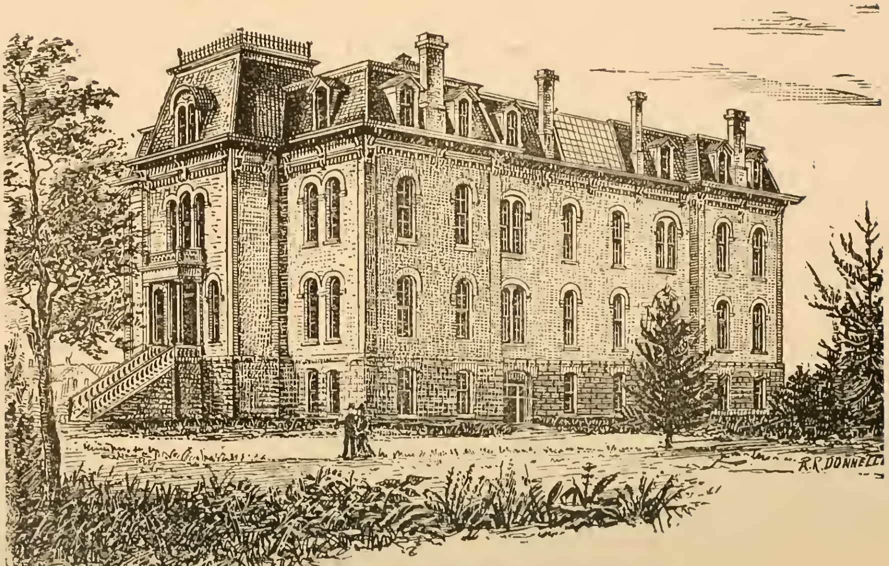
Commissions.—The Governor of the State is accustomed to commission as captains, by brevet, in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experince in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term of their attendance, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms, under careful leaders. Fee 50 cents.

The University Cornet Band is composed of students who while members of the band are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and other college exercises.



CHEMICAL LABORATORY.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

1. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signaling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signaling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire-Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

SCHOOL OF ART AND DESIGN.

PROFESSOR PETER ROOS.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen course may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the manufactures which they require has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

FIRST YEAR.

1. Form Analysis and Construction; Elementary Perspective; Combination Drawing.
2. Shading from Objects; Science of Perspective; Clay Modeling.
3. Drawing from Casts; Tinted Designs; Modeling of Ornaments.

SECOND YEAR.

1. Historic Styles of Ornament; Science of Color; Mould-making and Casting in Plaster.
2. Monochrome Painting; Designs from Plants; Modeling from Shaded Examples.
3. Constructive Designs; Water Color Drawing; Modeling from Nature.

Students having passed the above course may enter either of the following courses:

COURSE IN DESIGNING.

THIRD YEAR.

1. Decoration in Historic Styles; Drawing of Common Objects; Modeling.
2. Designs for Specified Material; Study of Drapery; Art Anatomy.
3. Designs for Furniture; Water Color Drawing; Art Anatomy.

FOURTH YEAR.

1. Tempera Painting; Designs for Monuments; Modeling.
2. Drawing from Life; Designs for Memorial Windows; Modeling.
3. Ecclesiastic Decoration; Emblems and Still Life in Tempera Color; Modeling or Oil Painting.

COURSE IN PAINTING.

THIRD YEAR.

1. Drawing from Statuary; Water Color Painting; Art Anatomy.
2. Imitation of Various Stuffs and Material; Drawing from Life.
3. Painting from Groups; Sketching from Nature; Art Anatomy.

FOURTH YEAR.

1. Drawing from Life; Composition; Painting of Still Life.
2. Painting from Life; Pictures from Description.
3. Painting from Nature; Illustration of Prescribed Subjects.

As a preparation for entering the course in Art and Design the study of Plane Geometry and Projection Drawing is recommended.

Topics for reading upon art subjects are given weekly.

Detail Studies and Sketches such as are necessary to the successful rendering of things, will be required outside of the regular exercises.

For admission to advanced classes the student must show proficiency in preliminary work.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duvenary's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudos de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740, Books 1, 2, 3; Cramer's Studies, Books 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Glementi's Gradus ad Parnassum.

TUITION.

Instruction term of ten weeks—2 lessons a week......	$10.00
For term of ten weeks—one lesson a week............	6.00
Practice on piano, one hour daily, per term...........	2.00

MISS KITTIE M. BAKER,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week......................	$12.00
Ten weeks—one lesson a week....	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents.

PREPARATORY STUDIES.

The studies taught in the preliminary year are as follows:

FOR COLLEGES OF AGRICULTURE, ENGINEERING, AND NATURAL SCIENCE.

First Term. — *Algebra.* — (Newcomb's.) Fundamental rules; factoring; common divisors and multiples; powers and roots; calcalus of radicals; simple equations; proportion and progression. *Physiology.*—(Dalton's or an equivalent.) *Natural Philosophy.*—(Norton's or an equivalent.)

Second Term.—*Algebra* —Quadratic equations, etc. *Geometry.*—(Chauvenet's.) Plane Geometry, lines, circumferences, angles, polygons, as far as equality. *English.*—Elements of composition. (Gilmore's Art of Expression, or equivalent.) Orthoepy and word analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—*Geometry* completed, including solid Geometry and the sphere. *English* as in the second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany.*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—*Algebra*, as above. *Latin* —Cicero's Orations. *Greek.*—Grammar and Reader.

Second Term.—*Algebra and Geometry*, as above given. *Latin.*—Virgil. *Greek.*—Xenophon's Anabasis.

Third Term.—*Geometry* completed. *Latin.*—Virgil's Æneid. *Greek.*—The Anabasis.

N. B.—Greek is required only for the School of Ancient Languages. The School of English and Modern Languages requires Physiology, Natural Philosophy, and Botany, instead of Greek.

Students in the preparatory studies are not matriculated as members of the University. They pay no entrance fee, but are charged a tuition fee of five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library and of the public lectures, and are required to drill.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOL.

The faculty, after personal examination, appoint accredited High Schools, whose graduates may be admitted to the University without further examination within one year after

date of their graduation. These must be schools of first-rate character, whose course of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	Chas. Raymond,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School,	M. Moore,	"
Decatur High School	John W. Gibson,	"
Urbana High School	J. W. Hays,	"
Oak Park High School	B. L. Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	O. S. Westcott,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park, High School	Leslie Lewis, Supt.	
Marengo High School	C. M. Bardwell,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High School	I. L. Betzer,	"
Springfied High School	F. R. Feitshans, Supt.	
Monticello High School	F. V. Dilatush.	"
Warren High School	D. E. Garver,	"
Peru High School	Joseph Carter,	"
Peoria High School	Geo. E. Knepper,	"
Galena High School	O. P. Bostwick,	"
Shelbyville High School	John T. Hall,	"
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	A. V. Greenman,	"
Rossville High School	S. B. Messer,	"
Bement High School	Wm. Sondericker,	"
Oakland High School	Charles I. Parker,	"
Jacksonville High School	H. M. Hamill, Supt.	
Danville High School	S. Y. Gillan,	"
Charleston High School	E. J. Hoenshel,	"
Tuscola High School	W. B. Wilson,	"
Streator High School	R. Williams,	"
Ottawa High School	D. R. A. Thorpe,	"
Bloomington High School	J. W. Heninger,	"
Aurora E. Side High School	N. A. Prentiss,	"
Paris High School	A. Harvey, Supt.	

UNIVERSITY DISCOURSES.

THIRD SERIES.

During the year a series of discourses has been delivered in the University Chapel on Sunday afternoons, by distinguished clergymen of various denominations, as follows :

Nov. 9 Rev. D. C. Marquis, D. D.
Subject : Faith, as related to Progress.

Nov. 23. Rev. Frank P. Woodbury, D. D.
Subject : Industrial Progress and the Extension of Life.

Dec. 14. Rev. John A. Broadus, D. D.
Subject : No one has a right to think lightly of Jesus.

Jan. 11. Rev. H. B. Ridgaway, D. D.
Subject : The freeness and stability of God's Word.

Feb. 1. Rev. Arthur Little, D. D.
Subject : The right use of power.

Feb. 22. Rev. John H. Worcester, Jr.
Subject : Godliness gain for both worlds.

Mar. 15. Rev. N. E. Wood, D. D.
Subject : College Christianity.

Apr. 12. Rev. Jenkin Lloyd Jones.
Subject : Temple Building.

May 3. Rev. S. C. Thrall, D. D.
Subject : Purity the foundation of Character.

May 17. Rev. M. S. Terry, D. D.
Subject : The Transfiguration.

The expenses of this course have been generously defrayed by Mr. Emory Cobb, of Kankakee.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as president of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University :

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study and number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree, and must present an accepted thesis.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law with statements of work done aud credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of their courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The degree of Bachelor of Letters, B. L., will be given to those who complete the course of the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course in the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued and passed examinations on a year of prescribed post-graduate studies, or after a term of three years' successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding-houses in Urbana and Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2 per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses see page 89.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor, is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed:

1. Notice that a College or a University, (which is properly a collection of Colleges,) is designed for the higher edu-

cation only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 31 and 32.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College (See page 83.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount $10.00

THE TERM FEE for Incidental Expenses is for each student.. 7.50

Room Rent in University Dormitory, each student per term,.............................. $2.00 to 6.00

Each student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $12, to pay for chemicals and apparatus used, and for any breakages or damages

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University·

	MIN.	MAX.
Term Fees and Room Rent for eaeh student...........	$ 28.50	$ 34.50
Table Board in Boarding Houses a.d Clubs	72.00	144.00
Fuel and Light...............	10.00	15.00
Washing at 75 cents per dozen	13.50	27.00
To al amount	$124.00	$220.50
Board and Room in Private Houses, per week..........	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition, per Term	$ 5.00
Incidental Fee, per Term............	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students....................	10.00
Graduating Fee...........	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money*, without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

CALENDAR FOR 1885-86.

Examinations for Admission	Monday,	September 14
First or Fall Term begins	Wednesday,	September 16
First Term ends	Wednesday,	December 23

WINTER VACATION.

FOR 1886.

Examination for Admission to Advanced Classes,	Tuesday,	January	5
Opening of the Second or Winter Term	Wednesday,	January	6
Anniversary Day		March	11
Second Term ends	Wednesday,	March	24
Third or Spring Term begins	Thursday,	March	25
Baccalaureate Address in University Chapel	Sunday,	June	6
Class Day	Monday,	June	7
Alumni Day	Tuesday,	June	8
Commencement	Wednesday,	June	9

SUMMER VACATION.

Examinations for Admission	Monday,	September 13
First or Fall Term begins	Wednesday,	September 15

LIST OF GRADUATES.

1872.

NAME.	OCCUPATION.	RESIDENCE.
Burwash, Milo B	Farmer	Champaign.
Davies, John J—B S	Physician	Racine, Wis.
Drewry, Henry N	Physician	Effingham.
Flagg, Alfred M Capt	Lawyer	Sioux Falls, Dak.
Hatch, Miles F	Lumberman	New Tacoma, W. T.
Lyman, George H	Civil Engineer	Little Rock, Ark.
Mathews, James N	Physician	Mason.
Parker, C E	Banker	Philo.
Reiss, Willis A	Teacher	Belleville.
Reynolds, S A Capt	Lawyer	Chicago.
Rickard, Thomas E Capt	Farmer	Springfield.
Ricker, N Cliff'd—M Arch	Professor of Architecture, Ill. Industr'l University	Champaign
Rolfe, Charles W—M S	Ass't Professor of Natural Science, I. I. U.	Champaign.
Silver, Charles W	Merchant	Newton, Kansas.
Silver, Howard	Prin. Pub. Sch'ls	Hutchison, Kansas.
Teeple, Jared	Merchant	Marengo.
Wharton, Jacob N	Machinist	Bement.
Whitcomb, Alonzo L	Physician	Tolono.
Wood, Reuben O Capt	Farmer	Woodburn.

1873.

Graham, Charles P	Clergyman	New Salem, Kansas.
Hatch, Fred L	Farmer	Spring Grove.
Hayes, Charles I—B S	Assayer	Denver, Col.
Hennessey, Augustus L	Editor	Chicago.
Hill, Edgar L Capt	Farmer	Austin, Texas.
Hook, Samuel H	Miner	Black Hills, Col.
Morrow, Andrew T	Farmer	Tonganoxie, Kan.
Ockerson, John A—B S	Civil Engineer	St Louis, Mo.

NOTE.—Graduates who have the rank of Captain have received commissions from the Governor of the State, as Captains in the Illinois National Guard.

*Deceased.

NAME.	OCCUPATION.	RESIDENCE.
Phillips, Parley A	Farmer	Damascus.
Platt, Franklin C Capt	Lawyer	Waterloo, Iowa.
Porterfield, Elijah N	Merchant	Kearney, Neb.
Robbins, Henry E	Prin Pub School	Lyons, Neb.
Swartz, Alex C–C E	Real Estate Agt	Beulah, Kan.
Williams, Lewis E	Farmer	Montrose, Iowa.

1874.

Baker, Ira O—C E	Professor of Civil Engineering Ill Ind University	Champaign.
Campbell, John P	Physician	Milton.
Drewry, Ebenezer L	Lawyer	Effingham ?
Eaton, Herbert	Printer	Champaign.
Ells, William C	Engineer of Masonry, A. T. & S. F and M. C. R. R.	Strong City, Kan.
Estep, Harvey C	Civil Engineer,	Olympia, W. T.
Foster, Charles W	Lawyer	Chicago.
Gabrialial, Gregory	Missionary	Asia Minor.
Gennadius, Panagiottis, B S	Com. of Ag.	Athens, Greece.
Jeffers, Charles P	Druggist	Swampscott, Mass.
Pickrell, William	Farmer	Pickrell, Neb.
Pierce, John L—B A	Lawyer	Norfolk, Neb.
Reynolds, Henry S–M S	Assayer	Glendale, M. T.
Smith, Charles A—B S	Mech Engineer	Terre Haute, Ind.
Storey, George	Civil Engineer	San Diego, Cal.
Watts, William	Physician	Sylvania, Ohio.
Wharry, Walter W Capt	Trav Salesman	Philadelphia, Pa.
Cheever, Alice	Mrs A H Bryan	Champaign.
Potter, F Adelia—B L	Mrs H S Reynolds	Glendale, M. T.

1875.

Barnard, D E	Farmer	Kankakee.
Barnes, Arthur D—B S	Druggist	Topeka, Kan.
Brown, Dillon S	Banker	Genoa.
Brown Ralph L—M L	Real Estate Agt	Aberdeen, Dak.
Coddington, Vantile W	Architect	Kansas City, Mo.
Dobson, Franklin P Capt	Civil Engineer	Grand View, Dak.
Dunlap, Burleigh A	Lawyer	Urbana.
Dunlap, Henry M	Farmer	Savoy.
Eaton, Ernest	Editor	Champaign.
Everhart, Winfield S Capt	Lawyer	Toledo.
*Falkner, James Capt	Oct. 2 1882	Bloomfield.

NAME.	OCCUPATION.	RESIDENCE.
Gridley, George N	Farmer	Half Day.
Kenower, George F–M L	Farmer	Bolivar, Mo.
Lefler, John E	Clergyman	Leavenworth, Kan.
Lyford, Charles C—B S	Vet Surgeon	Minneapolis, Minn.
McCauley, John C	Prin Pub School	Wilmington.
Muller, John	Physician	St Louis, Mo.
Parks, James H	Land Agent	Clarendon, Texas.
Parsons, F A—M L	Hardware Mer	Wellington Kan.
Patch, Emory	Machinist	Janesville, Wis.
Pickrell, Watson	LiveStockDealer	Pickrell, Neb.
Pollock, William C	Lawyer	Mt Vernon.
Robinson, Elna A	Machinist	Champaign.
Scovell, Melville A—M S	Chemist	Ottawa, Kan.
Scudder, Clarence O	Prin Pub School	Dixon.
Shawhan, George R—B L	County Superintendent of Schools Champaign Co.	Urbana.
Tyndale, Henry H	Lawyer	New York, N. Y.
Warner, L Fenn	Draughtsman	San Francisco, Cal.
Anderson, Laura	Mrs J R Greenhalgh	Champaign.
Campbell, Amanda	Mrs Milt'n Moore	Mansfield.
Hullinger, Kate	Mrs. Sterlings	Parker.
Kariher, Kate	Mrs Albert Eisner	Champaign.
Kellogg, Flora L	Mrs Hudson	Coldwater, Iowa.
Lee, Alice—B L	Mrs V W Coddington	Kansas City, Mo.
Pierce, Fannie	At home	Champaign.
Steele, Mary C—B L	Mrs N C Ricker	Champaign.
Stewart, Maggie E—B L	Mrs H E Robbins	Lyons, Iowa.

1876.

Allen, Ralph	Farmer	Delavan.
Ballou, Edward L	Assayer	Igo, Cal.
Campbell, James W	Lawyer	Topeka, Kan.
Chandler, William B	Farmer	Bourbon.
Clark, Charles W	Civil Engineer	St Louis, Mo.
Drake, James F	Lawyer	South Pueblo, Col.
Gill, John D	Lawyer	Chicago.
Gore, Simeon T	Architect	Chicago.
Gregory, Charles E–Capt	Lawyer	Carrington, Dak.
Knibloe, Walter E	Prin High Sch.	St Augustine, Fla.
Mackay, Daniel S	Lawyer	Mt Carroll
Mackay, Henry J	Lawyer	Mt Carroll
Mackay, William A Capt	U S Post. Service	Mt Carroll

NAME.	OCCUPATION.	RESIDENCE.
Mahan, H Weston	Merchant	Champaign
*Mann, A Howard	April 23, 1879	Winnebago, Cal.
Mann, Frank I Capt	Nurseryman	Gilman.
Mann, James R Capt	Lawyer	Chicago.
Noble, Louis R Capt—B S	Mech. Engineer	Mattoon.
Oliver, Will F Capt	Physician	Howard, Kan.
Palmer, Frank M Capt	Lawyer	Kansas City, Mo.
Pierce, Elon A	Teacher	Santa Rosa, Cal.
Rhodes, James F	Lawyer	Durango, Col.
Scribner, Artemus C	Commissioner	Minneapolis, Minn.
Starr, Frank A E Capt	Lawyer	Portland, Ore.
Stookey, D Wesley	Tile Manufact'r	Buffalo.
Weston, Charles H	Lawyer	Chicago.
*Wild, George A Capt	Nov., 1881	Las Animas, Col.
Williams, Thomas T	Farmer	Sterling.
Holton, Mattie S	Artist	Chicago.

1877.

Abbott, Theodore S—B S	Civil Engineer	Laredo, Texas
*Allen, Charles W—B L	July 8, 1880	Harristown.
Barry, Charles H Capt	Insurance Agent	Alton.
Barry, Frank Capt—B L	Special Fr't Agt	Minneapolis, Minn.
Blackall, C H Capt—M A	Architect	Boston, Mass.
Brush, Charles E	Architect	Carbondale.
Buckingham, William	Lawyer	Chicago.
Bumstead, James E	Physician	Dundee.
Clay, Luther G	Nurseryman	Cobden.
Crow, Benjamin F	Manager Mfg. Co.	Nebraska City, Neb.
Elliott, Charles G	Civil Engineer	Tonica.
Faulkner, Richard D	Merchant	San Francisco, Cal.
Gibson, Charles B Capt	Analytical Chem.	Chicago.
Gilkerson, Hiram Capt	Farmer	Hampshire.
Gilkerson, John	Lawyer	Hampshire.
Kennedy, Allan G Capt	Manufacturer	Minneapolis, Minn.
Lewis, Edward V Capt	Manufacturer	Council Bluffs, Ia.
Llewellyn, J C—B S	Supt Street R R	St. Louis, Mo.
McPherson, John	Engineer	Lexington, Ky.
Moore, John F	Architect	Minneapolis, Minn.
Rice, George C	Farmer	Charity.
Seymour, John J	Civil Engineer	Richmond, Ind.
Sim, Coler L. Capt	Druggist	Topeka, Kansas.

NAME.	OCCUPATION.	RESIDENCE.
Spencer, Franklin	Farmer	Nauvoo.
Stayman, John M	Machinist	Sterling, Kansas.
Stoddard, Ira J Capt	Civil Engineer	Oskaloosa, Iowa.
Ward Walter P—B L	Lawyer	Spencer, Iowa.
Whitham R. F–B.L. Capt	Farmer	Olympia, W. T.
Wright Myron J	Farmer	Woodstock.
Adams, Nettie	Mrs.W.B. Wilson	Indianapolis, Ind.
Bogardus, Eva	Artist	Champaign.
Broshar, Cornelia	Artist	Champaign.
Conn, Emma	Music Teacher	Champaign.
Falls, Ida Bell	At home	Champaign.
Gregory, Helen B—B A	Artist	Atlanta, Ga.
Maxwell, Emma C	At home	Philadelphia, Pa.
Page, Martha	Mrs F R Whitham	Olympia, W. T.
Platt, Emma C—B S	Mrs J C Llewellyn	St. Louis, Mo.
Skinner, Velma E	Mrs W P Ward	Spencer, Iowa.
Smith, Avice	Physician	Kansas City, Mo.
Switzer, Gertrude	Mrs H Peddicord	Champaign.
Victor, Carrie	Teacher	Champaign.

1878.

Baker, Edward J—B S	Farmer	Savoy.
Ballard, Charles K—B S	Real Estate Agt	Chicago.
Bridge, W E—B S Capt	Farmer	Caldwell, Kan.
Brown, Frank A	Lawyer	Aberdeen, Dak.
Bullard, Samuel A—B S	Architect	Springfield.
Burr, Ellis M—B S	Machinist	Champaign.
Cofflin, Frank S	Lawyer	Taylorville.
Coffman, Noah B—B S	Banker	New Tacoma, W. T.
Dean Frank A Capt	Merchant	Ulysses, Neb.
Francis, Fred	Watchmaker	Elgin.
Gaffner, Theodore	Physician	Trenton.
Gregory, A T—B A Capt	Real Estate Agt	Atlanta, Ga.
Hauser, Henry–B S Capt	Civil Engineer	Socorro, Col.
Lee, Ed O—B L	Lawyer	Mt. Carroll.
Lloyde, Frank H	Merchant	Champaign.
McLane, James A—B S	Architect	Chicago.
Moore, Aaron H		
Morava, Wensel-B S Capt	Machinist	Chicago.
Patchin, John	Lawyer	Grass Lake, Mich.
Pollock, James L—B L	Lawyer	Mt. Vernon.

NAME.	OCCUPATION.	RESIDENCE.
Richards, Chas L—B S	Lawyer	Chicago.
Rudy, William D—B S	Governm't Cl'k	Washington, D. C.
Rutan, Abram R	Farmer	Trinidad, Col.
Savage, Manford—B L	Lawyer	Hebron, Neb.
Sawyer, Hamlin W Capt	Real Estate Ag't	North Loup, Neb.
Sparks, Hosea B Capt	Miller	Alton.
*Spradling, William F	Nov. 30, 1881	Greenleaf, Kan.
Sprague, Martin	Lawyer	Forest City, Dak.
Weed, Mahlon O—B S	Teacher	Greenwood, Neb.
Whitlock, J F Capt—B L	Physician	Dwight.
Ziesing, August Capt—B S	Civil Engineer	Chicago.
Zimmerman, H W—B L	Chemist	La Salle.
Columbia, Emma	Mrs J R Mann	Chicago.
Culver, Nettie M—B L	At home	Henry.
Davis, Nannie J	Mrs M A Scovell	Sterling, Kan.
Deardorf, Sarah C—B S	Mrs B F Donnell	Winfield, Kan.
Estep, Ida M	Clerk	Olympia, W. T.
Estep, Jessie	At home	Rantoul.
Larned, Mary S	Mrs F A Parsons	Wellington, Kan.
Mahan, Jennie C	Mrs P W Plank	Champaign.
Page, Emma—M L	Music Teacher	Kansas City, Mo.
Page, Mary L—B S	Architect	Kansas City, Mo.

1879.

Beardsley, H M—M L	Lawyer	Champaign.
Bourne, Henry P—B S	Civil Engineer	Alamosa, Col.
Butler, William N	Lawyer	Cairo.
Coburn, R P Capt—B S	Merchant	San Antonio, Tex.
Freijs, Charles T Capt	Architect	Chicago.
Gunder, James—B S	Civil Engineer	Fairmount.
Hoit, Otis W—B S	Farmer	Geneseo.
Johnson, William P Capt	Manager Coal Co	Milwaukee, Wis.
Kays, Emery	Farmer	Buda.
Kimble, Willis P—B S	Civil Engineer	Chihuahua, Mex.
Kuhn, Isaac—B S	Merchant	Prescott, Arizona.
Lee, Elisha—B S	Farmer	Hamlet.
*Milton, Franklin S—B S	July 23, 1882	Plattviville, Col.
Stanton, S C Capt—B S	Physician	London, England.
Swannell, Arthur Capt	Merchant	Kankakee.
Taft, Lorado Z—M L	Sculptor	Paris, France.
Thompson, W A—B S Capt	Merchant	Chicago.

NAME.	OCCUPATION.	RESIDENCE.
Walker, Francis E Capt	Live St'k Breeder	Champaign.
Whitmire, Clarence L	Physician	Metamora.
Butts, Augusta E—B S	Teacher	Chicago.
Hale, Belle—B S	Teacher	Kewanee.
Kimberlin, Nettie D	Teacher	Mendota.
McAllister, Nettie C—BL	Mrs J H Miller	Sandwich.

1880.

Bley, John C—B L	Machinist	Rockford.
Briles, Bayard S—B S	Physician	Etna?
Conklin, Roland R	Banker	Kansas, Mo.
Cook, Charles F—B S	Merchant?	Edwardsville?
Groves, Charles W	Editor	Decatur.
Hafner, Christian F		Oak Park.
Harden, Edgar E	Banker	Liberty, Neb.
Hatch, Frank W—B L		Garden Prairie.
Hyde, Benjamin F	Draughtsman	Chicago.
Jones, Richard D.	Lawyer	Henry
Kingsbury, Charles S–B L		Leadville, Col.
Neely, Charles G—B L	Lawyer	Chicago.
Parker, William L–B S		Chicago.
Robinson, A F–B S	Bridge Eng A T & S F R R	Topeka, Kan.
Robinson, A S—B S	Journalist	Decatur.
Savage, George M—B L	Lawyer	Elma, W. T.
Sondericker, Jerome–C E	Asst. Prof. of Engineering and Mathematics I. I. U.	Champaign.
*Travis, William W.	Sept. 30, 1883	Bloomington
White, Frank—B S		Stillman Valley?
Bacon, Kittie I—B L	Teacher	Champaign.
Batcheler, Augusta	At home	Harristown.
Lucas, Corda C	Teacher	Champaign.
Parker, Minnie A—B L	Teacher	Decatur.
Pearman, Ida—B L	Mrs C E Stevens	Logansport, Ind.
Watson Ella M—B S	Mrs J H Davis	DeKalb.

1881.

Allison, James G	Stenographer	Galveston, Tex.
Armstrong, James E–B S	Teacher	Englewood.
Beach. Bayard E—B L	Real Estate Agt	Huron, Dak.
Bellamy, Albert	Merchant	Girard.

NAME.	OCCUPATION.	RESIDENCE.
Birney, Frank L	Physician	Sadorus.
Boothby, Arthur—B S	Draughtsman	Providence, R. I.
Boyd, Comma N Capt	Farmer	Sheffield.
Coddington, Arch O–B L	Prin Pub School	Barrington.
Cooper, Fred E—B S	Druggist	Van Buren Ark.
Davis, Arthur E—B L	Medical Student	St. Louis, Mo.
Dennis, C H—B L Capt	Reporter	Chicago.
Dressor, John C—B S	Bookkeeper	Jacksonville.
Forsyth, James	Engineer	Sterling, Kans.
Hammet, F W–B S Capt	Farmer	Camarago.
Hill, Fred L	Leveler C B & Q R R	Red Oak, Iowa.
Hill, T C—B A Capt	Teacher	Upper Alton.
Kingman, Arthur H	Supt Gold Mines	Charlotte, N. C.
McKay, Francis M–B L	Prin. Wash Pub School	Chicago.
Mansfield, Willis A–B L	Physician	Lacon.
Mason William K--B S	Farmer	Buda.
Morse, John H Capt	Prin Pub School	Metamora.
Pearman J Ora--B S	Physician	Champaign.
Pepoon Herman S—B S	Physician	Fremont, Neb.
Pepoon, William A	Stock Raiser	Fort Niobrara, Neb.
Philbrick, E–B S Capt	Civil Engineer	Chicago.
Pletcher, Francis M–B S	Stock Raiser	Fort Niobrara, Neb.
Porter, Frank H—Capt		San Jose, Cal.
Ross, Sprague D--B S	Local Historian	Princeton.
Schwartz, Joseph	Druggist	Salem.
Seymour, Arthur B—B S	Naturalist	Cambridge, Mass.
Slade, Byron A–B S Capt	Drug Clerk	Wabasha, Minn.
Stacy, Morelle M—B L	Stenographer	Chicago.
Sturman, James B—B L	Lawyer	Kansas City, Mo.
Talbot, A N—B S Capt	Civil Engineer	LaJunta, Col.
Weston, Wm S–B L & B S	Electrican	Chicago.
Wilson Maxwell B	Farmer	Paris.
Baker, Kittie M	Music Teacher I I U	Champaign.
Barnes, Bertha E—B L	Mrs S D Ross	Princeton.
Davis, Marietta—B L	Mrs H M Beardsley	Champaign.
Elder, Loretta K--B L	Clerk	Topeka, Kasas.
Hammett, Jennie M–B S	At Home	Camarago.
*Lawhead, Lucie M–B L	May 1, 1884	Champaign.
Lawrence, Nettie E	Mrs J A Allen	Tulare, Cal.
Macknet, Metta M I–B A	At Home	Girard.
Thomas, Darlie—B L	Bookkeeper	Bloomington.
Wright, Jessie A--B L	At Home	Champaign.

1882.

NAME.	OCCUPATION.	RESIDENCE.
Bailey, S G Jr Capt—B S	Merchant	Chicago.
Barnes, Charles C	Supt Sugar Fac'y	Franklin, Tenn.
Bridge, Arthur M Capt	Stock Farmer	Goldfield, Iowa.
Bullard, Benjamin F–B L	Merchant	Forest City, Dak.
Bullard, George W—B S	Architect	Springfield.
Carman, W B Capt—B S	Physician	Rochester, N. Y.
Cole. Edward E Capt	Lawyer	Champaign.
Curtiss, William G	Farmer	Nora.
Davis, Jeptha H	Farmer	De Kalb.
Eichberg, David Capt–B L	Law Student	Chicago.
Eisenmayer, A J Capt–B S	Merchant	Trenton.
Harrison, Samuel A—B A	Prin Pub School	St. Joseph.
Merritt, Charles H	Teacher	Mason City.
Neely, John R—B L	Governm't Clerk	Washington, D. C.
Noble, Thomas	Civil Engineer	Monterey, Mex.
Orr, Robert E Capt—B S	Civil Engineer	Chicago.
*Palmer, Charles W—BL	July, 1884	Austin, Texas.
Peabody, Arthur—B S	Architect	Chicago.
Richards, Geo W—B S	Civil Engineer	Carthage, N. M.
Roberts, Charles N—B S	Draughtsman	Jefferson.
Rugg, Fred D—B L	Merchant	Champaign.
Sharp, Abia J Capt—B S	Machinist	East Lynne, Mo.
Slaudeman, Frank—B S	Supt Elec Light	Decatur.
Slauson, Howard—B S	Ass't in Chem. Lab., I. I. U.	Champaign.
Smith, Chas L Capt—B L	Law Student	Albany, N. Y.
Spencer, Nelson S—B S	Architect	Beatrice, Neb.
Taft, Florizel A—B S	Banker	Hanover, Kan.
Todd, James—B S	Farmer	Elgin.
Turner, Herbert Capt	Farmer	Campbell, Minn.
Wadsworth, John G Capt	Clerk	Council Bluffs, Ia.
Andrus, Dora A—B L	Teacher	Ashton.
Avery, Kittie C—B L	At home	Omaha, Neb.
Cole, Fronia R	Teacher	Champaign.
Raley, Arvilla K	At home	Granville.

1883.

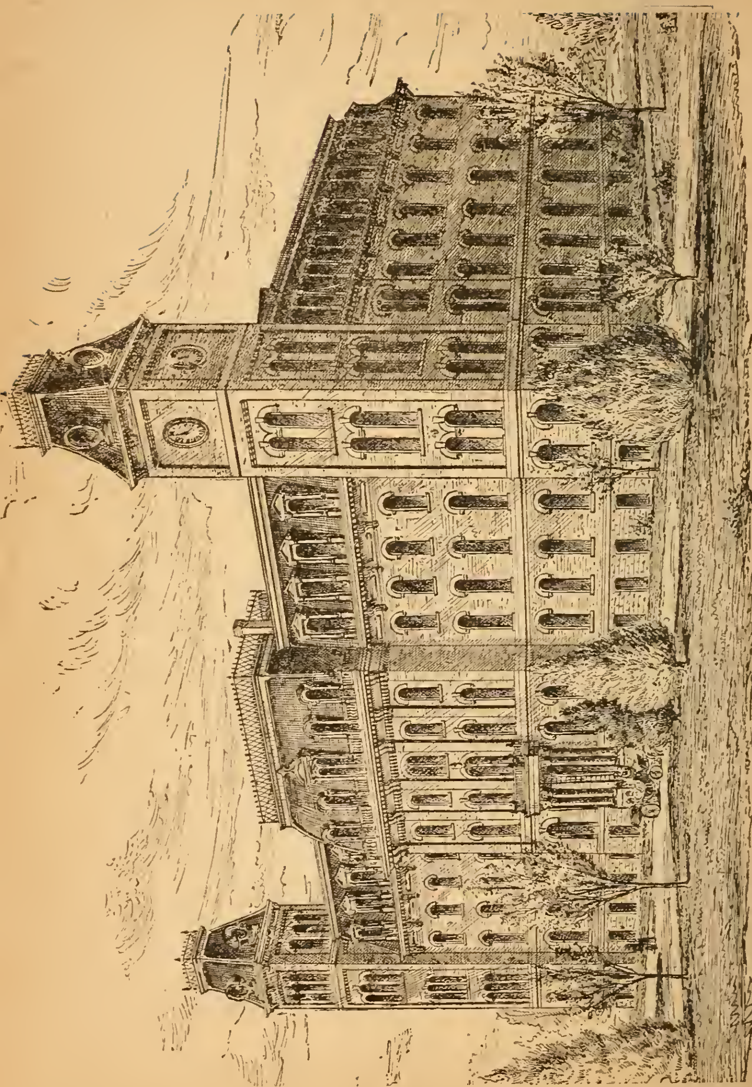
Abbott, Edward L—B S	Bridge Construc	New York City.
Adams, Charles F	Naturalist	Aukland, N Zeal'nd.
Bogardus, C Eugene–B S	At home	Champaign.
Brainard, Clarence	Civil Engineer	St. Louis, Mo.

NAME.	OCCUPATION.	RESIDENCE.
Craig, William P Capt	Farmer	Champaign.
Gates, Alphonso S—B S	U S Dept Min'l Sur	Spearfish, Dakota.
Goltra, Wm F Capt--B S	Civil Engineer	Bloomington.
Gray, Nelson A Capt-B L	Farmer	Thomasboro.
Haven, Dwight C Capt	Law Student	Joliet.
Heath, Wm A—B L	Bookkeeper	Champaign.
Hewes, George C—B S	Photographer	Payson.
Huey, Joseph D	Bill Clk C&A RR	St. Louis, Mo.
Kenower, John T—B S	Farmer	Bolivar, Mo.
Lewis, Ralph D	170 S Peoria St	Chicago.
McCune, H L Capt--B L	Lawyer	Ipava.
Moore, William D		Chatham ?
Palmer, Arthur W—B S	Ass't in Chem. Lab., Harv. Col.	Cambridge, Mass.
Peirce, Fred D Capt-B S	Stock Farmer	Gilman.
Piatt, Silas H	Express Agent	Minneapolis, Minn.
Scotchbrook, Geo P-B S		Morrison.
Sondericker William-B A	Teacher	Bement.
Weiss, Joseph—B S	Chemist, 81 Clark St.	Chicago.
Ashby, Lida M—B L	Teacher	Hebron, Neb.
Boggs, Hattie M—B A	Teacher	Tuscola.
Colvin, Mary S.	Prin Pub School	La Rose.
Fellows, Clara B—B L	Teacher	Millbank, Dakota.
Gardner, Jessie—B L	At Home	Champaign.
Healy, Grace—B L	At Home	Champaign.
Knowlton, Lizzie A-B L	Teacher	Champaign.
Langley, M Celeste-B L	At Home	Champaign.
Lewis, C Florence--B L	Mrs C J Bills	Endicott, Neb.
Peabody, Kate F--B L	Teacher	Jefferson.
Stewart, Ella M	At Home	Champaign.
Wright, Minnie E—B L	At Home	Champaign.

1884.

Abbot, Wm L	Draughtsman	Chicago.
Austin, James	Student	Altona.
Babcock, Guy H Capt	Farmer	Ridott.
Barber, Henry H—B S	Civil Engineer	Gordon, Neb.
*Bartholf, Emmet G—BA	Dec 28, 1884	Chicago.
Bartholf, Wm J—B A	Teacher	Arlington Heights.
Braucher, Arthur C—B S	Student	Lincoln.
Chapman, Norman W	Civil Engineer	Gordon, Neb.
Eberlein, Frederic W-B S	Med. Student	Chicago.

NAME.	OCCUPATION.	RESIDENCE.
Herdman, F E Capt–B S	Machinist	Chicago.
Hunt, Thomas F—B S		Champaign.
Kimball, Edwin R—B S	Cor. "Industrial World."	Champaign.
Lietze, Frederic A—B S	Draughtsman	Chicago.
Lilly, Charles H—B S	Merchant	Thomasboro.
Lilly James E	Hotel Keeper	Harold, D. T.
McCluer, Geo W—B S	Foreman of Horticultural Department, I I U	Champaign.
Montezuma, Charles–B S	Druggist	Chicago.
Morgan George N—B L	Student	Kinmundy.
Parr, Sam'l W—B S	Student	Ithaca, N. Y.
Philbrick, Solon Capt	Law Student	Champaign.
Roberts, L C Capt—B S	Clerk	Jefferson.
Rupp, Andrew O—B L	Teacher	Boynton.
Sizer, Lucius N Capt–B S	Teacher	Mahomet.
Speidel, Ernst—B S	Druggist	Detroit.
Stevens, Hubert A—B S	Civil Engineer	Chicago.
Stratton Sam'l W Capt	Student	Champaign.
Van Pelten, H S—B S	Druggist	Pawnee, Neb.
Vial, Edmund R—B S	At Home	Western Springs
Wills, Jerome G—B L	Teacher	Bement.
Ayers, Nettie—B L	Student	Urbana.
Barber, Ella U—B L	Teacher	Pana.
Braucher, Alma E—B S	Medical Student	Chicago.
Campbell, Juniata G–B L	Teacher	Aurora.
Clark, Lucy J	At Home	Champaign.
Conkling, Anna J--B L	At Home	Champaign.
Ellis, Lola D--B L	Teacher	Paris.
Hall, Lucy A	At Home	Champaign.
Hill, Cora J	Stenograper	Chicago.
Kemball, Georgetta–B L	Teacher	Pana.
Krause, Josephine	At Home	Sandy Point, Tex.
Sim, Kitturah E—B L	Teacher	Urbana.
Smith, Laura B--B L	At Home	Champaign.



LEARNING AND LABOR.

CIRCULAR

OF THE

UNIVERSITY OF ILLINOIS,

URBANA, CHAMPAIGN COUNTY, ILL.

SEPTEMBER, 1885.

CHAMPAIGN.
GAZETTE STEAM PRINT.

1885

BOARD OF TRUSTEES.

FACULTY.

SELIM H. PEABODY, Ph. D., LL. D.,
REGENT, and Professor of Mechanical Engineering.

THOMAS J. BURRILL, M. A., Ph. D.
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

GEORGE E. MORROW, M. A.,
Proressor of Agriculture.

PETER ROOS,
Professor of Industrial Art and Designing.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

WILLIAM McMURTRIE, E. M., Ph. D.,
Professor of Chemistry.

STEPHEN A. FORBES, Ph. D.,
Professor of Entomology and Zoology,
and State Entomologist.

CHARLES McCLURE,
Second Lieut., 18th Infantry, U. S. A.
Professor of Military Science and Tactics.

THEODORE B. COMSTOCK, B. S.,
Professor of Mining Engineering.

* JAMES H. BROWNLEE, M. A.,
Professor of Rhetoric and Oratory.

Professor of Veterinary Science.

CHARLES W. ROLFE, M. S.,
Assistant Professor of Geology.

ARTHUR T. WOODS,
Assistant Engineer, U. S. N.,
Assistant Professor of Mechanical Engineering.

ARTHUR N. TALBOT, C. E.,
Assistant Professor of Engineering and Mathematics.

* Will enter upon duty Jan. 1, 1886.

EDWIN A. KIMBALL,
Instructor in Iron-work, and Foreman.

GEORGE W. PARKER,
Instructor in Wood-work and Foreman.

JOSEPHINE A. CASS, M. A.,
Instructor in Ancient Languages.

HELEN B. GREGORY, B. L.,
Instructor in Modern Languages.

SAMUEL W. STRATTON,
Instructor in Mathematics.

KITTIE M. BAKER, B. S.,
Teacher of Vocal and Instrumental Music.

GEORGE C. HEWES, B. S.,
First Assistant in Chemical Laboratory.

DWIGHT H. BARRETT,
Second Assistant in Chemical Laboratory.

WILLIAM H. GARMAN,
Assistant in Zoological Laboratory.

GEORGE W. McCLUER, B. S.,
Foreman Horticultural Department.

A. B. BAKER,
Janitor.

Summary of Students for 1884-5.

By Classes.	Men.	Women	Total.
Resident Graduates	5	1	6
Seniors	42	13	55
Juniors	41	8	49
Sophomores	44	12	56
Freshmen	70	17	87
Preparatory	78	8	86
Special 90	12	11	23
Total	292	70	362

By Courses.	Men.	Women	Total.
Agriculture	21		21
Mechanical Engineering	56		56
Civil Engineering	58		58
Mining Engineering	1		1
Architecture	26		26
Chemistry	22	1	23
Natural History	15	5	20
Art and Design		11	11
English and Modern Languages	60	42	102
Ancient Languages	4		4
Not Specified	24	10	34
	287	69	356
Resident Graduates	5	1	6
Total	292	70	362

160
200

University of Illinois.

HISTORY.

The University of Illinois had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also has made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, until four Colleges, including ten distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1,954. The number graduated from the several Colleges, including the class of 1885, is 447. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1877 its exhibit at the Paris International Exposition gained a diploma and the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago.

at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The country is a region of beautiful rolling prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantation, arboretum, ornamental grounds, and military parade grounds.

The University buildings, fifteen in number, include a grand Main Building, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house.

The Main University Building, designed wholly for public uses, occupies three sides of a quadrangle, measuring 214 feet in front and 122 feet upon the wings. The Library wing is fire proof, and contains in spacious halls the Museum of Natural History, the Library, the Art Gallery, and the Museum of Engineering. The Chapel wing contains the Chapel, the Physical Laboratory and Lecture Room, and rooms for draughting and drawing. In the main front are convenient class-rooms; on the upper floor, elegant halls for literary societies. The building is warmed by steam from a boiler-house which forms the fourth side of the quadrangle in the rear.

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler-room, a machine shop, furnished for practical use with a steam engine, lathes, and other machinery; pattern and finishing shop; shops for carpentry and cabinet-work, furnished with wood-working machinery; paint and draughting rooms, and rooms for models, storage, etc. An addition built lately for a blacksmith shop, 32 by 36 feet, contains sixteen forges, with anvils and tools, and a cupola for melting iron. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also supplied with gymnastic apparatus. One of the towers contains an armorer's shop

and an artillery room: the other contains a printing office and editor's room.

The Chemical Building erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 15,000 acres of well selected lands in Minnesota. It has also endowment funds invested in State and County bonds amounting to $337,000.

Museums and Collections.

The Museum of Zoology and Geology occupies a hall 61 by 79 feet, with a gallery on three sides, and is completely furnished with wall, table, and alcove cases. It already contains interesting and important collections, equaled at few, if any, of the colleges of the West. They have been specially selected and prepared to illustrate the courses of study in the school of natural history, and to present a synoptical view of the zoology of the State.

Zoology.—The mounted *mammals* comprise an unusually large and instructive collection of the ruminants of our country, including male and female moose and elk, bison, deer, antelope, etc.; and, also, several quadrumana, large carnivora and fur-bearing animals, numerous rodents, and good representive marsupials, cetaceans, edentates, and monotremes. Fifty species of this class are represented by eighty specimens.

The collection of mounted *birds* (about five hundred specimens of two hundred and forty species) includes representatives of all the orders and families of North America, together with a number of characteristic tropical forms. Many of these specimens are excellent examples of artistic taxidermy. A series of several hundred unmounted skins is available for the practical study of species.

The set of *skeletons* contains examples of all the orders of mammals and birds except Proboscidea, together with typical representatives of the principal groups of reptiles, amphibians, and fishes.

The *cold-blooded vertebrates* are also illustrated by a very useful collection of alcoholic specimens, plaster casts, and mounted skins of the larger species, both interior and marine.

Conchology is illustrated by several thousand shells belonging to seventeen hundred species; together with alcoholic specimens of all classes and orders. The collection of Illinois shells is creditable, although partly incomplete.

The *entomological cabinet* contains about three thousand species (principally American) named, labelled, and systematically arranged. The *lower invertebrates* are represented by several hundred dried specimens and alcoholics, and by a large series of the famous Blaschka glass models.

Geology.—The geological collection comprises casts of many of the largest and most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the mollusks, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils from Germany, and collections, suitably arranged for practical study from this and other States, illustrate the different formations. There is a good collection of foot-prints from the Connecticut river sand-stones.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species. The recent establishment at the University of the office of the State Entomologist of Illinois makes available to students of this subject the entomological library and the collections of that office, and affords an extraordinary opportunity for observation of the methods of work and research in economic entomology.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of grasses and sedges. There are, besides, many other North American plants and some exotics. A collection of Fungi, includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees and shrubs of Stephenson county, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystalized; these, with a complete set of imported models, fully illustrate crystalography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

A series of standard weights and measures has been received from the office of the Coast and Geodetic Survey of the United States Government, and may be consulted at the Physical Laboratory.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, shapers, milling-machine, drill presses, and the requisite hand tools, benches, vises, anvils, etc., for pattern-shop, blacksmith-shop, moulding-room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the workshops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, illustrating sections of

mines, machinery for elevating and breaking ore, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture it embraces thirteen full-size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great masterpieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

Museum of Engineering and Architecture.—A large room is devoted to the gathering of a museum of practical art, the materials for which have been constantly accumulating in the various schools of science. It will contain full lines of illustrations of the work of the shops; models made at the University or purchased abroad; drawings in all departments; patent-office models, etc.; samples of building materials, natural and artificial; with whatever may be secured that will teach or illustrate in this most important phase of University work.

A notable feature of this collection is the gift of Henry Lord Gay, Architect, of Chicago. It consists of a model in plaster, and a complete set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first King of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was to have been seven and a quarter million of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for

political reasons. Mr. Gay's generous gift occupies the place of honor in the Museum of Engineering and Architecture.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 14,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading-room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study is encouraged or required. The reading room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received:

PERIODICALS IN THE LIBRARY, 1885.

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Country Gentleman.
Breeder's Gazette.
Indiana Farmer.
New England Farmer.
Michigan Farmer.
Farmer and Fruit-Grower.
Iowa Homestead.
Agricultural Gazette, *London.*
Gardeners' Chronicle. *London.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal, monthly and weekly.
Horticulturist.
Farmers' Review.
Veterinary Journal.
Industrialist.
Poultry Keeper.
Farm, Field and Stockman.

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Builder, *London.*
American Engineer.
Transactions American Society of Civil Engineers.
Engineering News.
Engineering and Mining Journal.
Scientific American.
Scientific American Supplement.
Sanitary Engineer.
Van Nostrand's Engineering Magazine.
The Workshop.
American Architect.
American Machinist.
Western Manufacturer.
Gazette of Patent Office.
Mechanics.
Locomotive.
American Artisan.

SCIENTIFIC.

Botanique.
Annales des Sciences Naturelles, Botanique, *Paris.*
Annales des Sciences Naturelles, Zoologie, *Paris.*
Science.
Nature. *London.*
American Naturalist.

Grevillea, *London.*
Journal of Microscopical Science.
Decorator and Furnisher.
Art Amateur.
Portfolio, *London.*
Comptes Rendus. *Paris.*
Chemical News, *London.*
Journal of Chemical Society, *London.*
American Journal of Chemistry.
Boston Journal of Chemistry.
Jahrbericht der Chemie, *Giessen.*
Zeitschrift fur An Chemie.
Berichte der Deutschen Chemischen Gesellschaft, *Berlin.*
Lancet, *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
Journal of Franklin Institute.
Journal de Mathematiques.
Mathematical Quarterly.
Annals of Mathematics.
Monthly Weather Review.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review.
Contemporary Review.
Fortnightly Review.
North American Review.
Atlantic Monthly.
Century.
Dial.
Literary World.
American Journal of Education.
Education.
Legal Adviser.
Revue des Deux Mondes, *Paris.*
Deutsche Rundschau, *Berlin.*
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Musical Record.
Signal.
The Rock-Islander.
Country and Village Schools.

The exchanges of the *Illini* are also free to the students in the Library.

Aims of the University.

The University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and of the State Legislature:

"Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and profession in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning, scientific and classical—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its

Colleges from the older Institutions of this country. It embraces four Colleges, which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools:

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.

School of Civil Engineering. School of Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.

School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music are taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required:—that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physiography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and designing, Elements of Construction, Graphical Statistics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, and Political Economy.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, on the two days previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical qualities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and Composition. These are required, in addition to the subjects specified in 1 and 2, for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology, Botany, Natural Philosophy; Latin Grammar and Reader, Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

5. Latin (as in 4), Greek Grammar and Reader, four books Xenophon's Anabasis, and Greek Prose Composition in addition to the subjects of 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also, "*Preliminary year.*"

COUNTY SUPERINTENDENTS' CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches, Arithmetic, Geography, English Grammer, and history of the United States; applicants who pass creditably will, when they present the superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.

College of Agriculture.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR MORROW, Dean.
PROFESSOR BURRILL.
PROFESSOR McMURTRIE.
PROFESSOR FORBES.
PROFESSOR ROLFE.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the

composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming" but a knowledge of the real nature of all true farming —of the great natural laws of the farm and its phenomena— this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, Agricultural and Horticultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships, or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of Agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; laws especially affecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

HORTICULTURE.

Elements of Horticulture.—The following topics are discussed: Orchard sites; the age of trees to plant; the season to plant; how to plant; what to plant; the management of the soil; pruning and care of trees; gathering and preserving fruit; disease and injuries; the nursery; ornamental trees and shrubs; flower gardens; vegetable gardens, including propagating beds and houses; the vineyard and small fruits, and timber tree plantation. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history, and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy; then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects, including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the school. Excursions are made when found practicable, for the study of public and private grounds.

The three following studies constitute a year's work, designed for those who wish to prepare themselves for special horticultural pursuits, and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each is pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of

trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the aboretum, afford practical illustrations.

Plant-Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the domestic animals is taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the students may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term practical instruction is given in clinical work, as cases present themselves, at the Veterinary Infirmary, where animals are treated or operated on free of charge for the instruction of the students. Lectures are given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science further than is laid down in the agricultural course, will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery; Veterinary Medicines, Their Action and Uses, by Finlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

LABORATORY WORK.

Experiments and special investigations by each student. A Thesis is required, embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorology, see statements in *College of Natural Science.*

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns and Jerseys, Berkshire and Poland-China Swine, and Shropshiredown, Southdown, and Cotswold Sheep to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture, under the direction of the Professors of Agriculture and Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the hill-side barn. The barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large windmill which furnishes power for grinding feed, and for other purposes.

A veterinary hall and stable have been provided, and a clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier mache* models of the foot and the teeth of the horse at different ages.

Surveying and drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is

pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College there are:

1. A very large specimen apple orchard, planted in 1869, and containing about 1,000 varieties—many varieties of pears, cherries, grapes, and small fruits.

2. A nursery of young trees, in which students have regular work in propagation, etc.

3. A forest tree plantation, embracing the most useful kinds of timber.

4. An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different materials and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *models clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects, and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College has a supply of compound microscopes and apparatus, and students have opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture; Chemistry; Trigonometry; Shop practice (optional).
2. Elements of Horticulture; Chemistry; British Authors, or Free Hand Drawing.
3. Economic Entomology; Chemistry; Rhetoric.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Botany; German.
2. Agricultural Chemistry (Soils and Plants), Zoology or Botany; German.
3. Agricultural Chemistry (Tillage, Fertilizers, Foods); Vegetable Physiology; German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; German.
2. Animal Husbandry; Veterinary Science; Veterinary Materia Medica (optional extra); Physics or Geology.
3. Landscape Gardening; Veterinary Science; Physics or Geology.

FOURTH YEAR.

1. Physiography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 26 and 27.

FARMER'S COURSE.

Students who have not the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course. are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Economic Entomology or Landscape Gardening.

College of Engineering.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR RICKER, Dean.
PROFESSOR SHATTUCK.
PROFESSOR TALBOT.
MR. KIMBALL.
PROFESSOR BAKER.
PROFESSOR WOODS.
PROFESSOR COMSTOCK.
MR. PARKER.

SCHOOLS,

MECHANICAL ENGINEERING, ARCHITECTURE, CIVIL ENGINEERING, AND MINING ENGINEERING.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text book, and the drawings made on smooth paper, eight by ten inches.

STUDIES PURSUED BY ALL ENGINEERING STUDENTS.

The subjects common to all the schools in the College of Engineering will be described first; the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between trigonometrical functions of an angle or arc: relations between the functions of different angles or arcs: construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and subtangent, normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

Advanced Algebra.—Functions and their notation; series and the theory of limits; imaginary quantities; general theory of equations.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane area, surface and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc., algebraic curves.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; the point, right line, plane, and surfaces of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications; elements of elliptic integrals.

PHYSICS.

The course of Physics embraces the kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are more effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The Department of Physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light optics and electricity from Stoehrer, of Leipsic, and Browning and Newton, of London; pneumatic and electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Brothers, London, resistance coils, galvanometers, etc., for higher researchers in electricity.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective; drawing of machines, bridges, roofs, etc., finished by line shading, tints, and colors.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering.—Plain and ornamental alphabets; titles and title pages; round and stump writing.

Descriptive Geometry.—Problems on the point, right line, and plane; warped surfaces; perspective; shades and shadows; practical problems.

APPLIED MATHEMATICS.

Analytical Mechanics.—Polygon of forces; equations of equilibrium of moments; center of gravity; moment of inertia: acceleration, work, momentum, impact; motion of free particles; central forces; constrained motion.

Strength of Materials.—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas.

Hydraulics.—Amount and center of pressure upon submerged surfices; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities. Forms and arrangement of orifices for fountains.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College exercises:

For manuscripts and unimportant drawings, a heavy flat-cap paper.

For ordinary drawings, not colored, a heavy, first quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings and lettering, the best three-ply Bristol board. For problems, exercises, lecture notes, theses, and other manuscripts, and for geometrical projection, topographical, railroad, typographical, and construction drawings, paper 8x11½ inches, the size of the plate being 8x10, with 1½ added for binding. If Bristol board is used, it must be cut 8x10 inches, and the binding margin hinged on with muslin.

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title pape neatly lettered with India ink or colors. It must be upon regulation paper, and securely bound. It will be prepared during the latter part of the fourth year, and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labelled with donors' names, and placed in the Museum of Engineering and Architecture, for the inspection of students and the illustration of lectures.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory is counted as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and by text books. Examples are given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents five different shops, viz.:

1—Pattern Making.
2—Blacksmithing.
3—Foundry Work.
4—Bench Work for Iron.
5—Machine Tool Work for Iron.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, the process of moulding and casting are fully illustrated.

In the 4th, there is first a course of free-hand bench work, the cold chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 5th shop, the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Previous to the shop work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact, cams and curves in sliding contact; gear teeth; gearing chains; escapements; link work.

Prime Movers.—The theory and useful effects of turbine water wheels, and best form of the parts for high efficiency. Other water wheels and wind wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill Work and Machinery.—Trains of mechanism studied with reference to their resistance and efficiency; best forms for transmission of power for short or great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use, according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The

student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his designs into execution, and teaches him to so shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

The steam engine, large drill press, one engine lathe, the hand lathes, and the milling machine, now in use, were designed here, and built in the shop, by students in the department.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by each student. They take indicator diagrams from the engine of the Mechanical Laboratories, and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop, furnished with complete sets of tools, benches, vises, and forges, with flasks for moulding in sand, and cupola for melting iron.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; German or French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; German or French.
3. Advanced Algebra; Free Hand Drawing; Shop Practice; German or French.

SECOND YEAR.

1. Calculus; Designing and Construction of Machines; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German or French.
3. Advanced Calculus; Astronomy; German or French.

THIRD YEAR.

1. Mechanism; Advanced Descriptive Geometry; Chemistry.
2. Analytical Mechanics; Chemistry; Physics.
3. Analytical Mechanics; Engineering Materials; Physics.

FOURTH YEAR.

1. Prime Movers; Resistance of Materials and Hydraulics; Mental Science.
2. Prime Movers; Construction Drawing; Constitutional History.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of either French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies

with greater ease and advantage. With this view the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text books, and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid interference of hours of recitation, and because the studies are there given in the order which best meets the preparation of the student.

TECHNICAL STUDIES.

Astronomy.—Descriptive Astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the altazimuth instrument, the astronomical transit, the sextant, and the engineer's transit adapted to astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges.—Calculation of stresses in the various forms of bridge trusses, by algebraic and graphical methods, consideration being given to weights of bridge and train, and force of wind; designing trusses and proportioning sections; details.

Geodesy.—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; projection of maps.

Land Surveying.—Areas and distances, by chain, com-

pass, and plane table; omissions and corrections; metrical system; methods of U. S. public land surveys; magnetic variation; determination of true meridian.

Railroad Surveying.—Economic location; curves and grades, and their inter-adjustment; earth work; curvature and elevation of rail; easement curves; turnouts; crossings; maintenance of way.

Stone Work.—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topography.—Use of stadia, plane table, and level; contours; soundings. Sketching, mapping, conventional signs; city and county maps.

Theory of Engineering Instruments.—Examination of workmanship and design; testing instrument maker's adjustments; engineer's adjustments; determination of areas with transit; inaccessible and air line distances; profiles; heights and distances with stadia; measurement of angles with sextant, etc.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term an accurate topographical survey of a locality is made by the class, in which the stadia and plane table are used as in the United States surveys.

In the fall term of the third year the class will execute a project in railroad engineering, which will consist of preliminary surveys, location, staking out, drawings, computations of earth work, etc. The preliminary survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice.—The school is well provided with the instruments necessary for the different branches of engineering field practice, which include chains, tape, compass, plane table, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observation. An astronomical observatory is provided with an equatorial telescope, an astronomical transit, with attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton & Simms, of London, is used for instruction in Geodesy and Practical Astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photolithographs of bridges, roofs, and engineering structures; it has access to the Museum of Engineering and Architecture, which contains models illustrating wood, stone, and metal construction, and to a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The Library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French or German.
3. Advanced Algebra; Free-Hand Drawing; Shop Practice; French or German.

SECOND YEAR.

1. Calculus; Land Surveying; French or German.
2. Advanced Analytical Geometry; Surveying and Theory of Instruments; French or German.
3. Advanced Calculus; Topographical Surveying and Drawing; French or German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Chemistry; Railroad Engineering.
2. Analytical Mechanics; Chemistry; Physics.
3. Analytical Mechanics; Astronomy; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geodesy and Practical Astronomy; Mental Science.
2. Bridges; Stone Work; Constitutional History.
3. Geology; Bridge Construction; Political Economy.

In this course the student will take two years of German or French, but not one year of each.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory has the following position:
Latitude, 40° 6′ 29″.66.
Longitude, West of Washington, 11° 10′ 37″.5, or 44m. 42.5s.
Elevation above sea level, 720 feet.

SCHOOL OF MINING ENGINEERING.

OBJECT OF THE SCHOOL.

This school has been established to meet the growing demand of a very important industry for thoroughly trained engineers, fitted to solve the numerous perplexing problems which are constantly arising in all mining work. The subjects of the discovery, opening, economical working and proper ventilation of mines, the prevention of accidents, transportation above and below ground, treatment of products, with many others which fall within the scope of the mining engineer, can be mastered only by a careful study of facts and principles. This is the proper foundation for the practical work of the profession, and it is the aim of this school to present this in the most complete and thorough manner.

INSTRUCTION.

It is important that a broad basis be laid by way of general preparation for the more technical studies here

included. Whatever of general culture the student may obtain before entering the University, will not come amiss, and, although the requirement is not made, it is advised that all who can do so, should acquire a reading knowledge of French or German before beginning this course.

The course comprises the greater part of the pure and applied mathematics of the courses in Mechanical and Civil Engineering. Much time is devoted to Chemistry and Geology, with the addition of technical studies peculiar to mining engineering, and metallurgy.

Students who are graduated from this school are not supposed to be familiar with all the details of mine management from actual experience, but they will have obtained such a knowledge of the principles underlying all successful practice, and such a familiarity with the science of mining in all its branches, that the art may be acquired with the minimum of practice.

Lectures are given where desirable, but these are to be regarded as supplementary to other modes of instruction, which are made to conform as closely as possible to the routine of the engineer in practice. In every detail the student is made to feel that he is dealing with the actual problems which he will meet in his professional work.

Plans, estimates, drawings, reports, and calculations, based upon data obtained in the student's own experience, are constantly required, and no pains is spared to familiarize each member of the class with the duties and responsibilities of every grade, from miner to manager.

COURSE OF STUDIES.

In the first two years the work is similar to that required in the course in Civil Engineering, but more time is given to chemistry. In the third year geology and Mining Engineering, with assaying and metallurgy, take the places of special technical studies in the other engineering courses. In the fourth year, with the exception of two terms of Prime Movers taken with the students in Mechanical Engineering, and some studies of general character, the work is strictly technical.

TECHNICAL STUDIES.

Mine Surveying and Reconnoitering.—History, uses, and adjustment of instruments; solar compass and various solar

attachments; practical problems involving the running of surface lines and lines under ground; connecting of surface and underground surveys; practice of U. S. deputy surveyors. Details of mine surveys, setting of bench works; lines through shafts, drifts, slopes, etc.; keeping of records, plans, etc. Surveys required to determine best locations for test borings, shafts, adits, etc.; methods of reconnoitering.

Mining Engineering.—*1. Attack.*—Tools, implements, machinery, and explosives, with principles governing their use. Methods of boring, sinking, and driving through hard, soft, wet, dry, loose, and compact material.

2. Timbering.—Objects, methods, etc.; framing, fitting, bracing.

3. Transportation.—Underground haulage, hoisting, use of chutes; apparatus and appliances, cars, tracks, switches, cables, cages, motive power, connections; haulage in inclines, "man-engines," etc.

4. Drainage.—Pumps, pumping, sumps, ditches; drainage of working shafts and inclines.

5. Ventilation.—Means and appliances. Importance of subject; laws of various states and countries. Discussion of fundamental principles and practical applications, with results.

6. Buildings and Machinery.—Hoisting apparatus, air compressors, power drills, etc.

7. Exploration.—To determine general character and extent of deposits in advance of development; methods and aims.

8. Development.—Blocking out of deposits to prove values of partly explored ground, and to prepare for further exploration.

9. Exploitation.—Laying out work; trimming of coal, ore, etc.; stoping, overhand and underhand; winzes and intermediate levels; economical handling of product. Methods to be employed under various conditions.

10. Dislocations.—Faults, upthrows, downthrows, feeders, leaders, rolls, swells, etc. Means of overcoming difficulties.

Dressing of Products.—Coal screening; washing, sampling, and grading ore; assorting, crushing, spalling, cobbing; concentrating.

Mining Machinery.—Elements of construction, designing of plant, combining of parts; setting, arranging, adjusting. Preservation and operation, general economy.

Organization.—Economy of management. Secondary superintendence; division of labor and adjustment of responsibility. Prevention of accidents.

Administration.—Review of principles. System of reports from sub-officers and tabulation of records. Accounts, forms, analysis, pay-tolls, cost sheets, etc. Letting and measuring contracts. Miscellaneous details.

Engineering Geology.—Applications of geology to engineering and mining. Nature and distribution of deposits of economic value, as coal, water, metallic ores, etc.; advanced structural geology and lithology; discussion of principles underlying successful working of mines, placing of foundations, setting of machinery and erection of structures in various situations. Relation of geological structure to drainage, economy of working, selection of points of attack, methods of exploration, etc.

APPARATUS.

The department has a valuable collection of models of mining and metallurgical machinery, and new material will be added as fast as the devolopment of the school will require, and the funds furnished will permit.

The extensive apparatus and collections in other departments are available, and these comprise a large amount of material which is useful for this purpose.

COURSE IN MINING ENGINEERING.

Required for the Degree of B. S. in School of Mining Engineering.

FRESHMAN YEAR.

1. Trigonometry; Projection Drawing; Chemistry; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Chemistry; French or German.
3. Advanced Algebra; Free-Hand Drawing; Chemistry; French or German.

SOPHOMORE YEAR.

1. Land Surveying; Calculus; Chemistry.
2. Theory of Instruments; Advanced Analytical Geometry; Physics.
3. Topographical Surveying; Advanced Calculus; Physics.

JUNIOR YEAR.

1. Mine Surveying; Analytical Mechanics; Mineralogy.
2. Geology; Resistance of Materials; Assaying.
3. Geology; Mining Engineering; Metallurgy.

SENIOR YEAR.

1. Engineering Geology; Prime Movers; Mental Science.
2. Mining Engineering; Prime Movers; Constitutional History.
3. Mining Engineering; Mine Administration; Political Economy.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The school prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

The course embraces the knowledge of theory and principles of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with reference to text books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed; also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

TECHNICAL STUDIES.

Elements of Drawing.—Lectures; designs for specified problems; outline sketches and finished drawings from casts in pencil, crayon, and charcoal.

Wood Construction.—Frames, roof, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction.—Materials, mortars and cements, walls, foundations, stone cutting, tools and modes of using.

Brick Construction.—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction.—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, girders, and beams.

Tinner's Work, Slating, and Plastering.

Sanitary Construction.—Scientific principles and practical methods employed in plumbing, water supply, and drainage of buildings.

Architectural Drawing.—Finishing in line, ink, sepia, and color; working out from sketches full sets of drawings for buildings; practical perspective; shades and shadows.

Architectural Designing.—Original sketches for specific projects; one full set of drawings for buildings for specified private or public purpose.

History of Architecture.—Daily lectures and recitations on principal styles, their characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracing of details; designs for special problems.

Esthetics of Architecture.—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings; art objects, furniture, carpets, etc. About twenty-five original designs for specified objects.

Estimates.—Methods of measurement; cost of labor and materials; estimates for specified works.

Agreements and Specifications.—Preparation of sets.

Heating and Ventilation.—Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products. Problems and applications to specified buildings.

Graphical Statics.—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record.

All such plates must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term.—Carpentry and Joinery. Planing flat, square, and octagonal prisms, and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; miter, lap, and gained joints; through and lap dovetails; mouldings, miters, and panels.

Second Term.—Turning and cabinet making; cylinders, balusters, capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering; inlaying, carving, and polishing.

Third Term.—Metal work, pattern making, moulding and casting, filing and finishing, drilling, screws, hand and machine turning.

Stone work executed in plaster of Paris; production of plane, ruled, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr, of Berlin, belong to the Schools of Architecture and Designing; models of ceilings, roof trusses, stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws; planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's Course must pass the examinations in the common branches, but need not pass in the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Fee, $10 per term.

BUILDER'S COURSE.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making).

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Advanced Algebra; Graphical Statics; Shop Practice; French.

SECOND YEAR.

1. Elements of Wood Construction; Calculus; Free Hand Drawing and Modeling.
2. Elements of Stone, Brick, and Metal Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Elements of Sanitary Construction; Advanced Calculus; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Advanced Descriptive Geometry; Chemistry.
2. History of Architecture; Analytical Mechanics; Physics.
3. History of Architecture; Analytical Mechanics; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing; Heating and Ventilation; Constitutional History.
3. Architectural Designing; Estimates, Agreements, and Specifications; Political Economy.

College of Natural Science.

SPECIAL FACULTY.

The REGENT.

PROFESSOR McMURTRIE, Dean.
PROFESSOR BURRILL,
PROFESSOR FORBES.
PROFESSOR COMSTOCK.
PROFESSOR ROLFE.
MR. HEWES.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year.

Their preparation should be specially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in the course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

The first term of the first year is occupied by text-book instruction, lectures, and experiments in the laboratory, illus-

trating the elementary principles of chemistry, chemical physics, and inorganic chemistry. The second term is devoted to laboratory practice in qualitative analysis. In the third term recitations upon organic chemistry and illustrative synthetic experiments alternate with laboratory practice in qualitative analysis. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required, at the end of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Text Books.—Roscoe's Chemistry; Remsen's Organic Chemistry; Fresenius' Analysis; Bolton's Analysis; Sutton's Volumetric Analysis; Bunsen's Gasometry; Rickett's Assaying; Gore's Electro-Metallurgy; Johnson's How Crops Grow and How Crops Feed.

Books of Reference.—Gmelin's Handbook of Chemistry; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie; Watts' Dictionary of Chemistry; Roscoe and Schorlemmer's Treatise on Chemistry; Armstrong's Miller's Chemistry; Lehmann's Physiological Chemistry; Percy's Metallurgy; Mitchell's Practical Assaying; Wormley's Micro-Chemistry of Poisons; Taylor on Poisons.

Deposits.—At the beginning of each term of Laboratory practice, each student will deposit twelve dollars with the business agent of the University. At the end of the term, the balance left, after deducting payment for gas, chemicals, and apparatus used, will be refunded.

Five courses of laboratory work have been arranged, as follows:

CHEMICAL COURSE.

FIRST YEAR.

First Term.—General, theoretical, and applied chemistry. Lectures, text-book, and experiments.

Second Term.—Qualitative analysis begun; tests and separation of the bases and acids.

Third Term.—Qualitative analysis completed. Examination of 20 simple salts and 20 compound substances, natural and commercial products. Organic chemistry. Text-book and recitations.

SECOND YEAR.

First Term.—Quantitative analysis of barium chloride, sodium phosphate, Rochelle salt, calcite, ammoniumferric sulphate. Volumetric analysis. Acidimetry and alkalimetry.

Second Term.—Quantitative analysis. Limestone, clay, spathic iron ore, calamine, copper pyrites, tetrahedrite. Volumetric analysis of iron, zinc, etc.

Third Term.—Advanced organic Chemistry. Ultimate organic analysis. Determination of carbon, hydrogen, nitrogen, chlorine, phosphorus, and sulphur, in carbon compounds.

THIRD YEAR.

First Term.—Advanced organic Chemistry, continued. Organic Synthesis and Analysis. Preparation of Carbon compounds, and determinations of composition and formulas.

Second Term.—Assaying. Dry assay of gold, silver, lead, and tin ores. Volumetric assay of silver, lead, copper, and zinc ores, bullion, etc. Blow pipe assays of silver ores.

Third Term.—Analysis of Soil. Valuation of commercial fertilizers—phosphates, nitrogenous matter, and alkaline salts. Analysis of milk, butter, corn, and wheat. Examination of alcoholic liquors.

FOURTH YEAR.

First Term.—Gas Analysis. Calibration of eudiometers. Analysis of air from lungs, atmospheric air, marsh gas, crude coal gas. Analysis of mineral water. Preparations.

Second Term.—Toxicology. Micro-Chemistry of Poisons. Testing for mineral and vegetable poisons. Separation from organic mixtures. Preparations.

Third Term.—Original researches. Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Quantitative analysis of commercial drugs, bismuth subnitrate, tartar emetic, sodium bicarbonate, potassium iodide, sodium bromide, ammonium carbonate, potassium nitrate, cream tartar, phosphites. Volumetric determination.

Third Term.—Same as in Chemical course.

THIRD YEAR.

First Term.—Same as in Chemical course, substituting preparation and analysis of organic chemicals for analysis of urine.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs—oils, resins, gums, alkaloids, glucosides, etc.

Third Term.—Materia Medica. Reading and compounding prescriptions. Preparation and valuation of tinctures and extracts. Examination of commercial organic drugs.

FOURTH YEAR.

First Term.—Analysis of urine, normal and pathological. Mineral waters. Examination of alcoholic liquors.

Second Term.—Toxicology. Micro-chemistry of Poisons. Separation of poisons from organic mixtures.

Third Term.—Original researches. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

Arranged for students desiring to make a specialty of this branch.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative analysis of barium chloride, magnesium sulphate, ammonium sulphate, calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term.—Analysis of ashes of plants, soil, mineral waters.

Third Term.—Analysis of commercial fertilizers, manures and mineral used for manures, apatite, phosphates, guanos, nitrates.

THIRD YEAR.

First Term.—Same as in Chemical course, omitting analysis of urine. Analysis of corn, wheat, and fodder.

Second Term. Analysis of milk, butter, cheese. Analysis of sugars by polariscope and by titration. Examination of alcoholic liquors.

Third Term.—Original researches.

COURSE IN AGRICULTURAL CHEMISTRY.

Especially arranged for students in the School of Agriculture.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Analysis of soil, ashes of plants, commercial fertilizers, manures, and materials employed in their production—apatite, phosphates, guanos, animal matters, ammonia salts, nitrates, and marls.

Third Term.—Analysis of corn, wheat, hay, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Assaying.* Same as in Chemical course.

Third Term.—Analysis of calamine, spathic iron ore, magnetic iron ore, copper pyrites, galena, nickel ore, manganese ore, cinnabar, grey antimony.

* Students who take this term's work must have had a term of Mineralogy.

THIRD YEAR.

First Term.—Analysis of slags from copper, zinc, and lead; iron furnace and mill slags.

Second Term.—Analysis of pig iron, wrought iron, steel, commercial copper, lead, zinc, bullion.

Third Term.—Analysis of fuels, wood, anthracite and bituminous coals, coke, determination of heating power. Analysis of ashes and furnace cinders; mineral waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected at an expense, including furniture, of $40,000.

The basement contains a furnace room for assaying and metallurgical operation; a mill room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood, gas, and water. There are a spectroscope table, a blow pipe table for general use, and a store room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing chemical balances of the manufacture of Bunge (short beams), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating, to avoid undue fluctuations of temperature, furnished with a table specially constructed, and con-

taining a full set of Bunsen's gasometric apparatus, an induction coil, battery, mercury, etc.; and a store room with apparatus for all kinds of work in quantitative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of aeometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen, and a potassium dichromate battery; a galvanometer; a spectroscope; microscopes; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry, General and Applied; Trigonometry; American Authors or French.
2. Chemistry and Laboratory Practice; Conic Sections; British Authors or French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Rhetoric or French.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry and Laboratory Practice; Microscopy; German.
3. Agricultural Chemistry and Laboratory Practice; Vegetable Physiology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Practice; Mental Science; Physiography.
2. Laboratory Practice; Constitutional History; Logic.
3. Laboratory Practice; Political Economy; Geology.

Students who are candidates for the degree of B. S. in the School of Chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

A term of Photography will be provided for students who desire it; it will consist of text-book work, with recitations and daily practice.

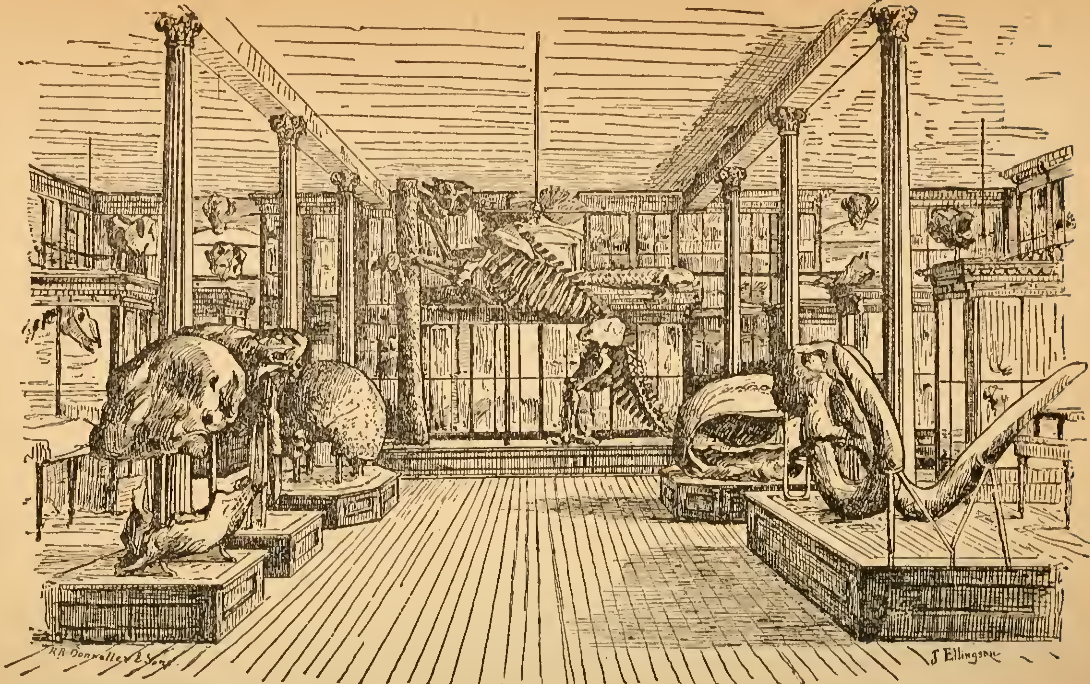
SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens, and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall term of the Sophomore year, systematic and structural Botany is continued by recitations, illustrated lectures, and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the Laboratory. Each student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass sides for mounting objects, and razor for making thin sections.

For the first term, a Manual of Botany (Gray's or Wood's) and Bessey's Botany are required. Before using the compound microscopes and other apparatus furnished by the University, a deposit of three dollars is required, but no charge is made except for damage and material used. The first half of the term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance, etc., together with a history of a few special plants and their products. During this time, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramineæ, etc., especially such as are best obtained in Autumn. During the last half of the term the general morphology of plants, including vegetable anatomy and history, is studied, practical laboratory work being the basis of the instruction. Tests are made from time to time by the use of disguised vegetable substances.



MUSEUM.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied.

The most important books of reference in the English language are Sach's Text-Book of Botany, LeMaout and Decaisne's Botany, Gray's Structural Botany, Lindley's Introduction to Botany, Berkley's Cryptogamic Botany and Fungology, Cook's Fungi and Handbook of British Fungi.

Vegetable Physiology is studied in the third term. The instruction is given by lectures and experimental practice. The work includes: The food of plants and its absorption and assimilation; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.; processes, peculiarities, and results of growth; relations and effects of temperature, light, gravitation, etc.; self and cross fertilization, relation of plants and insects; movements, "sleep of plants," tendrils, climbing vines, etc.; origin and development.

Throughout the course the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authorities for the facts stated.

Microscopy.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly but not exclusively devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skillful and rational use of the instrument, and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn tables, etc., are furnished by the University.

Anatomy and Physiology.—This subject is presented during the first term of the Junior year. Anatomy is taught by lectures illustrated by skeletons, manikin, models in *papier mache*, and microscopical preparations. Fresh specimens of various organs are dissected and demonstrated before the class during the term. Physiology is taught by lectures, demonstrations, and recitations from Martin's treatise, The Human Body.

The library contains many of the best books of reference, including works on Anatomy by Gray, Holden, Quain, Ellis, and Morton; and on Physiology by Flint, Dalton, Kuss, McKendrick, Kirk, Draper, and Marshall.

Zoology.—The object of the Zoological course is primarily to give the students command of the methods of Zoological research and study, and to derive from these their distinctive discipline. The subject is taught during the whole of the Sophomore year, the course being based throughout on individual work in the Zoological laboratory, and in the field. The results thus arrived at are supplemented by lectures and demonstrations, and by the study of text.

The first term is devoted to comparative dissections of types of the great groups, and to a study of the subkingdoms and classes of animals; the second term to comparative histology and the elements of embryology—both based on individual work with the microscope—and the third, to the determination and description of species, to the study of life histories, and to collections, field observations, and laboratory experiments, the course closing with lectures and discussions on the final generalizations and fundamental principles of Zoological science.

The natural history students electing a Zoological subject for their term's work in "natural history laboratory," in the senior year, are furnished all necessary appliances for the pursuit of whatever subject they may select, as a piece of original work, with such guidance, oversight, and suggestion as each may seem to require.

Geology is taught during the second and third terms of the Junior year. LeConte's Geology is used as a text book. The first term is given to instruction upon the dynamical

effects of water in eroding, transporting, and depositing materials; upon the action of heat as manifested in metamorphism, crystalization, consolidation, and the production of mountain folds; upon the nature and material of rocks, veins, dykes, etc., and upon the arrangement and distribution of metals and their ores. The second term is devoted to the consideration of the historic development of the earth as revealed by the study of the animals and plants entombed therein; and to a discussion of the elements of time, the system of life, the origin of species, and the antiquity of man.

Physiography, or the "study of nature," is taught by illustrated lectures during the first term of the Senior year. The subjects considered are: The origin of the earth, and its relation to other worlds; the distribution of land and water; the direction and extent of mountain chains and of ocean currents; the influences which determine the climate of any locality; the systematic distribution of animals and plants; and especially the biological position of man, and his relation to the animate and inanimate worlds around him. Anthropology is taught as a distinct part of the term's work; for this a text book is used.

Entomology.—The study of Entomology, pursued during a single term of the Freshman year, is necessarily made largely empirical and practical, the subject to which it is principally directed being the place of the insect world in the general system of organic life; and, incidentally to this, the relations of insects to the interests of man.

The foundation for a knowledge of structural Entomology is laid by the discussion and detailed study of a typical insect; and for that of the orders, by a generalization of the characters of selected groups of specimens representing each.

A large part of the time is devoted to the study of the characters, life histories, habits, and economic relations of one hundred species of especially important insects. Specimens of these in their different stages, together with synopses and descriptions of the families to which they belong, are furnished the students, and the essential facts not discoverable by direct observation, are given in lectures or acquired by study of text.

Practice in field observations is given as opportunity offers, and all are taught the ordinary methods of the collection, preparation, and care of specimens, together with the approved methods of controlling the ravages of the injurious species. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school.

Besides the collections, apparatus, and entomological library of the University, the students in this course have access to the collections and library of the State Entomologist, and the practical use of the many thousand duplicate insects belonging to the office. In the field and laboratory operations of the office, an extraordinary opportunity is afforded competent students of this course to observe and assist in practical entomological work and original research.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization, is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blow pipe. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The greenhouses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *paper-mache* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit

his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has twenty compound microscopes, four different styles from Europe, instruments by all prominent American makers, and others of which the glasses were made to order in Europe, and the stands manufactured in the shops of the University.

Zoology.—The Museum is particularly fortunate in its collections in Zoology, possessing, in mounted specimens of skeletons, nearly all the ruminants of North America, and representatives of all orders of mammals except Proboscidea; exhibiting fifty species by eighty mounted specimens, with numerous skeletons. In birds it represents all the families of North America, having two hundred and forty species, represented by over four hundred specimens. Its Articulates number more than three thousand specimens; its fishes, four hundred; its radiates, three hundred, and its reptiles nearly one hundred. Sea, land, and fluviatile shells are represented by seventeen hundred species. The Museum also contains nearly one hundred specimens, representing the osteology of vertebrates; a large collection of the nests and eggs of birds; a collection of Indian implements; and a manikin, a dissected eye, and a trachea, in *papier-mache.*

Geology.—The Geological Cabinet contains Prof. Ward's celebrated college series of casts of famous fossils, including the gigantic Megatherium nearly eighteen feet in length; the Elephas Ganesa with tusks ten-and-a-half feet long; the Collossochelys Atlas,—a gigantic tortoise with a shell eight feet by six; and the Plesiosaurus Cramptoni, twenty-two and a half feet. It also contains a series of tracks in the sandstone of the Connecticut river; a large collection of carboniferous ferns from the celebrated locality at Morris, Ill.; several thousand specimens of fossils from the State Geological Survey, and from purchase in Europe; and a large number of specimens illustrating building materials, dikes, veins, metamorphism, drift bowlders, etc.

Mineralogy.—The Cabinet of Minerals consists of a valuable and extensive collection of the leads of the State, and accompanying minerals; a collection of models, compris-

ing the most important forms and combinations in the various systems of crystallization; and a very complete collection of minerals, both American and foreign.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing (optional); Trigonometry; French.
2. Chemistry; Free-Hand Drawing (optional); Conic Sections; French.
3. Chemistry or Free-Hand Drawing; Economic Entomology; Rhetoric; French (extra).

SECOND YEAR.

1. Zoology; Botany; German.
2. Zoology; Botany; German.
3. Zoology; Vegetable Physiology; German.

THIRD YEAR.

1. Anatomy and Physiology; Mineralogy; German; Ancient History (optional, extra).
2. Geology; Physics; German; Mediæval History (optional, extra).
3. Geology; Physics; Modern History.

FOURTH YEAR.

1. Physiography; History of Civilization; Mental Science.
2. Microscopy; Constitutional History; Logic.
3. Natural History Laboratory Work; Astronomy; Political Economy.

In this course three terms of University Latin will be accepted in lieu of three terms of French; and five terms of such Latin for five terms of German.

College of Literature and Science.

SPECIAL FACULTY.

THE REGENT.

PROFESSOR SNYDER, Dean.
PROFESSOR SHATTUCK,
PROFESSOR PICKARD,
MISS CASS,
PROFESSOR CRAWFORD,
PROFESSOR ROOS,
MISS GREGORY.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned below, but not the Greek. Students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the School of Ancient Languages will be examined in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody (Harkness,' or Allen and Greenough's); Latin prose composition (forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 196, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition); four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's) Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned*

The so-called Continental sounds of the vowels and dipthongs, and pronounciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, and professors, in their special departments, require a knowledge of the ancient, as well as of modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through the Schools to provide for this important part of its mission—the furnishing of teachers to industrial schools of the country, and investigators and writers for the arts.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, and other work intended to illustrate the studies pursued, and to exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes

are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of, practice in English Composition should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with a requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over fourteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on pages 18 and 19.)

SUBJECTS COMMON TO THE SCHOOLS OF THIS COLLEGE.

MATHEMATICS.

First Term.—Trigonometry, plane and spherical ; fundamental relations between the trigonometrical functions of an angle or arc ; relations between the functions of different angles or arcs ; construction and use of tables ; solution of triangles ; angles as functions of sides, and sides as functions of angles ; applications.

Second Term.—Conic Sections, geometrical method. Definitions and general properties of the ellipse, hyperbola, and parabola ; curvature of the conic sections. Analytical Geometry, elements of. Properties and relations of the point and right line in a plane ; of the conic sections.

Third Term.—Advanced Geometry ; Modern Geometry. Harmonic proportion and harmonic pencils ; anharmonic ratio and involution ; poles and polars in relation to a circle ; the radial axes and centers of similitude of two circles ; the principle of continuity ; elementary principles of projection.

Text Books.—Coffin's Conic Sections and Analytical Geometry ; Mulcahy's Modern Geometry.

PHYSICS AND ASTRONOMY.

For these subjects, see College of Engineering.

NATURAL SCIENCE.

See College of Natural Science.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the Junior and Senior years of the University Course.

JUNIOR YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; European Geography.

SENIOR YEAR.

Constitutional History of England and the United States; History of Civilization; Analysis of Historical Forces and Phenomena, Notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers and are therefore confined to the Senior year of the University Course.

Mental Philosophy. Analysis and classification of mental phenomena ; theories of perception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful condition of thought, growth and decay of mental and moral powers. Philosophy of education, theory of conscience ; nature of moral obligation ; moral feeling. The Right. The Good. Practical ethics ; duties. Formation of character. Ancient schools of philosophy ; modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic ; conditions of valid thinking ; forms of arguments ; fallacies and their classification. Inductive and scientific reasoning ; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and the formation of the habits of thinking and common judgment of life.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School —In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical languages. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read an entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts, or original compositions on themes assigned, are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the Senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German, and to Philology. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease scientific and other works in these languages, and may, with a little practice write and speak them with correctness. Constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage in linguistic culture is gained by the student. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select reading, composition, and conversation.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia ; French ; Trigonometry.
2. British Authors or Livy ; French ; Conic Sections.
3. Rhetoric ; French ; Advanced Geometry, or Free-Hand Drawing ; Horace (optional, extra).

SECOND YEAR.

1. English Classics ; German ; Physiology or Botany.
2. English Classics ; German ; Zoology or Botany.
3. English Classics ; German ; Astronomy.

THIRD YEAR.

1. German ; Chemistry ; Ancient History.
2. German ; Physics ; Mediæval History.
3. German ; Physics or Chemistry ; Modern History.

FOURTH YEAR.

1. Anglo-Saxon ; Mental Science ; History of Civilization.
2. Early English ; Logic ; Constitutional History.
3. Philology ; Political Economy ; Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the School of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who contemplates the course in

Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning, illustrating the works read. In the first term of the third year Ancient History is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for the students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition ; Iliad and prose composition ; Trigonometry.
2. Livy and prose composition ; Odyssey and prose composition ; Conic Sections.
3. Odes of Horace and prose composition ; Memorabilia and prose composition ; Advanced Geometry.

SECOND YEAR.

1. Satires of Horace ; Thucydides or German ; Physiology.
2. Terrence ; Sophocles or German ; Zoology.
3. Tacitus ; Demosthenes or German ; Astronomy.

THIRD YEAR.

1. Juvenal or French ; Chemistry ; Ancient History.
2. Quintilian or French ; Physics ; Mediæval History.
3. De Officiis or French ; Physics ; Modern History.

FOURTH YEAR.

1. Mental Science ; History of Civilization ; Physiography.
2. Logic ; Constitutional History ; Early English.
3. Political Economy ; Philology ; Geology.

RHETORIC AND ORATORY.

Particular attention will be given to training in writing and speaking, in which all students of all departments will be required to participate. It is intended to give such a course of instruction both elementary and advanced as shall make it probable that all students who have taken any full course of instruction in literature or in science may write clearly and intelligently, and may speak without affectation or embarrassment. Prof. J. H. Brownlee will enter upon this work at the beginning of the next year.

Additional Schools.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR CHARLES McCLURE.

2ND LIEUT. 18TH INFANTRY, U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the Preparatory year and of College classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises :

School of the Soldier : Manual of Arms.
School of the Company ; Movements by Platoons. Firings, etc.
School of the Battalion ; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill ; Bugle Calls.
Bayonet Fencing ; Target Practice.
Guard and Picket Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is under the charge of Lieut. Charles McClure, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other course of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State is accustomed to commission as captains, by brevet, in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term of their attendance, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready made on their arrival here. The University cap is ornamented in front with the initials U. of I., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms, under careful leaders. Fee, 50 cents.

The University Cornet Band is composed of students who, while members of the band, are excused from drill. Instruments and music are furnished by the University, and the band plays at drill, and other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

1. School of the Soldier and Company ; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion ; Skirmish Drill.
2. Ceremonies and Reviews ; Military Signaling ; Sword Fencing.
3. Guard, Outpost, and Picket Duty ; Military Signaling ; Sword Fencing.

THIRD YEAR.

1. Military Administration ; Reports and Returns ; Theory of Fire-Arms ; Target Practice ; Artillery Drill.
2. Organization of Armies ; Art of War ; Field Fortifications ; Artillery Drill.

SCHOOL OF ART AND DESIGN.

PROFESSOR PETER ROOS.

This School is to subserve a two-fold purpose : 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen course may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics, and to the skill and taste of workmen.

The increased interest in the decorative arts, and in the manufactures which they require, has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

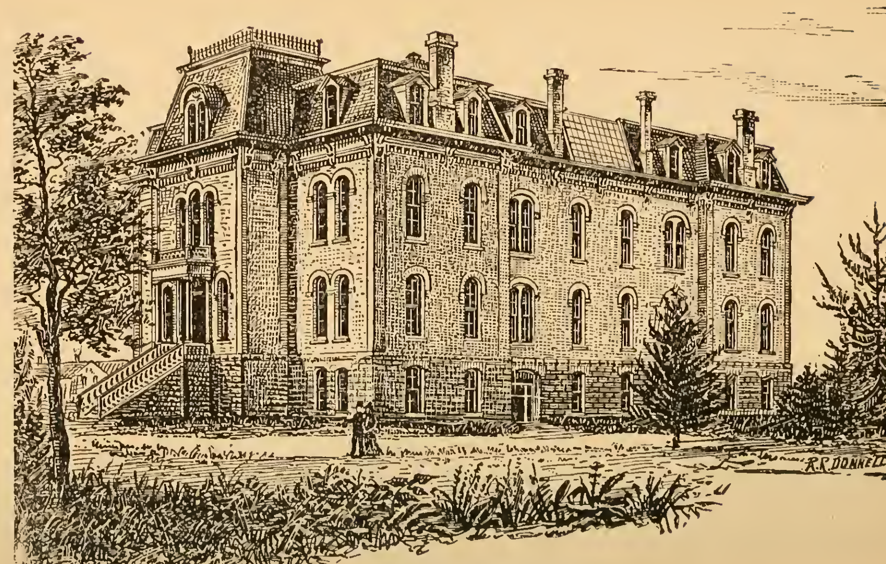
FIRST YEAR.

1. Form Analysis and Construction ; Elementary Perspective ; Combination Drawing.
2. Shading from Objects ; Science of Perspective ; Clay Modeling.
3. Drawing from Casts ; Tinted Designs ; Modeling of Ornaments.

SECOND YEAR.

1. Historic Styles of Ornament ; Science of Color ; Mould-making and Casting in Plaster.
2. Monochrome Painting ; Designs from Plants ; Modeling from Shaded Examples.
3. Constructive Designs ; Water Color Drawing ; Modeling from Nature.

Students having passed the above course may enter either of the following courses :



CHEMICAL LABORATORY.

COURSE IN DESIGNING.

THIRD YEAR.

1. Decoration in Historic Styles; Drawing of Common Objects; Modeling.
2. Designs for Specified Material; Study of Drapery; Art Anatomy.
3. Designs for Furniture; Water Color Drawing; Art Anatomy.

FOURTH YEAR.

1. Tempera Painting; Designs for Monuments; Modeling.
2. Drawing from Life; Designs for Memorial Windows; Modeling.
3. Ecclesiastic Decoration; Emblems and Still Life in Tempera Color; Modeling or Oil Painting.

COURSE IN PAINTING.

THIRD YEAR.

1. Drawing from Statuary; Water Color Painting; Art Anatomy.
2. Imitation of Various Stuffs and Materials; Drawing from Life.
3. Painting from Groups; Sketching from Nature; Art Anatomy.

FOURTH YEAR.

1. Drawing from Life; Composition; Painting of Still Life.
2. Painting from Life; Pictures from Description.
3. Painting from Nature; Illustration of Prescribed Subjects.

As a preparation for entering the course in Art and Design, the study of Plane Geometry and Projection Drawing is recommended.

Topics for reading upon art subjects are given weekly.

Detail Studies and Sketches such as are necessary to the successful rendering of things, will be required outside of the regular exercises.

For admission to advanced classes the student must show proficiency in preliminary work.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees; and rooms set apart for instruction.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines. Op. 36. 37. 38; Heller's Studies. Op. 36. Books 1 and 2: Duvenary's Studies. Books 1. 2. 3; Loschhorn's Klavier-Technik: Czerny's Etudos de la Velocite. Op. 299. Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740. Books 1. 2. 3; Cramer's Studies, Books 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction term of ten weeks—2 lessons a week	$10.00
For term of ten weeks. one lesson a week	6.00
Practice on piano. one hour daily. per term	2.00

MISS KITTIE M. BAKER,

Teacher of Vocal Music and Voice Culture. follows the Italian method. giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course. except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic. Geography. English Grammar. and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents.

PREPARATORY STUDIES.

The studies taught in the preliminary year are as follows:

FOR COLLEGES OF AGRICULTURE, ENGINEERING, AND NATURAL SCIENCE.

First Term.—Algebra.—(Olney's.) Fundamental rules; factoring; common divisors and multiples; powers and roots; calculus of radicals; simple equations; proportion and progression. *Physiology.*—(Dunglison's, or an equivalent. *Natural Philosophy.*—(Norton's, or an equivalent.)

Second Term.—Algebra.—Quadratic equations, etc. *Geometry.*—(Chauvenet's.) Plane Geometry, lines, circumferences, angles, polygons, as far as equality. *English.*—Elements of composition. (Gilmore's Art of Expression, or equivalent.) Orthoepy and word analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed, including solid Geometry and the sphere. *English,* as in the second term, with addition of Goldsmith's Traveler, or an equivalent, read for analysis. *Botany.*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin.*—Cicero's Orations. *Greek.*—Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin.*—Virgil. *Greek.*—Xenophon's Anabasis.

Third Term.—Geometry completed. *Latin.*—Virgil's Æneid. *Greek.*—The Anabasis.

N. B.—Greek is required for only the School of Ancient Languages. The School of English and Modern Languages requires Physiology, Natural Philosophy, and Botany, instead of Greek.

Students in the preparatory studies are not matriculated as members of the University. They pay no entrance fee, but are charged a tuition fee of five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library, and of the public lectures, and are required to drill.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The faculty, after personal examination, appoints accredited High Schools, whose graduates may be admitted to the University without further examination within one year after date of their graduation. These must be schools of first rate character, whose course of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS,

Princeton High School	Chas. Raymond,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	John W. Gibson,	"
Urbana High School	J. W. Hays,	"
Oak Park High School	B. L. Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	O. S. Westcott,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park High School	Leslie Lewis, Supt.	
Marengo High School	C. M. Bardwell,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High School	I. L. Betzer,	"
Springfield High School	F. R. Feitshans, Supt.	
Monticello High School	F. V. Dilatush,	"
Warren High School	D. E. Carver,	"
Peru High School	Joseph Carter,	"
Peoria High School	Geo. E. Knepper,	"
Galena High School	O. P. Bostwick,	"
Shelbyville High School		
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	A. V. Greenman,	"
Rossville High School	S. B. Messer,	"
Bement High School	C. W. Groves,	"
Oakland High School	Moses Andrews,	"
Jacksonville High School	H. M. Hamill, Supt.	
Danville High School	S. Y. Gillan,	"

Charleston High School	E. J. Hœnshel,	Principal.
Tuscola High School	W. B. Wilson,	"
Streator High School	R. Williams,	"
Ottawa High School	D. R. A. Thorpe,	"
Bloomington High School	J. W. Heninger,	"
Aurora E. Side High School	N. A. Prentiss, Supt.	
Paris High School	A. Harvey, Supt.	

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as president of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies; and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law, the following system of Degrees has been adopted for the University:

1. All studies will remain, as heretofore, free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and number of studies, as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree, and must present an accepted thesis.

3. Students not candidates for any degree will be

enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of their courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The degree of Bachelor of Letters, B. L., will be given to those who complete the course of the School of English and Modern Languages.

7. The degree of Bachelor of Arts, B. A., will be given to those who complete the course in the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued a year of prescribed post-graduate studies, and passed examinations thereon, or after a term of three years' successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding-houses in Urbana and Champaign, within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2 per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses, see page 85.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor, is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases, it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such, these words are addressed:

1. Notice that a College or a University (which is properly a collection of Colleges) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading, and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 22 and 23.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other prepar-

atory studies required for admission to College (See pp. 76–7.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.	
THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount	$10.00
THE TERM FEE for Incidental Expenses is for each student....................................	7.50
ROOM Rent in University Dormitory, each student per term.................................$2.00 to	6.00

Each student working in Laboratories, or in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $12, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University:

	MIN.	MAX.
Term Fees and Room Rent for each student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing at 75 cents per dozen	13.50	27.00
Total amount	$124.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR.

Tuition per Term	$ 5.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Music, for 20 Lessons	$10.00
For Painting or Drawing, to Special Students	10.00
Matriculation Fee	10.00
Graduation Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money*, without the authoritative care of some prudent friend. Half the dissipation in colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

CALENDAR FOR 1885-86.

Examinations for Admission................	Monday.	September 14
First or Fall Term begins..................	Wednesday.	September 16
First Term ends..........................	Wednesday.	December 23

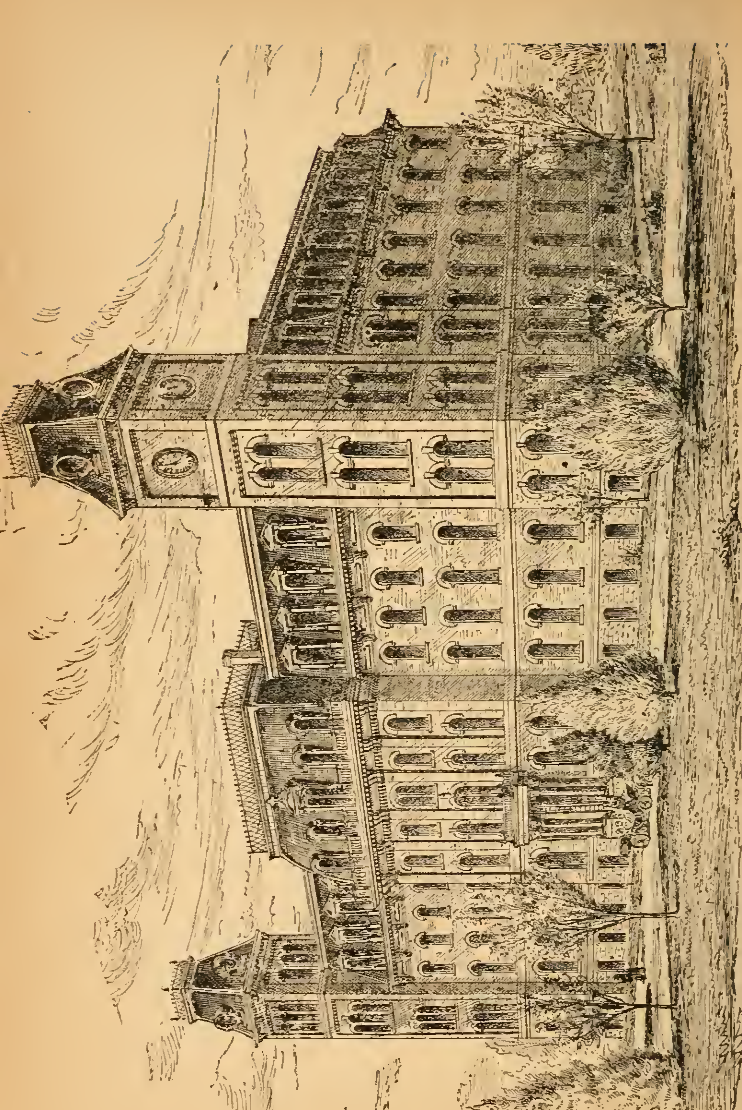
WINTER VACATION.

FOR 1886.

Examination for Admission to Advanced Classes.	Tuesday.	January 5
Opening of the Second or Winter Term........	Wednesday.	January 6
Anniversary Day..........................		March 11
Second Term ends.........................	Wednesday.	March 24
Third or Spring Term begins................	Thursday.	March 25
Baccalaureate Address in University Chapel....	Sunday.	June 6
Class Day................................	Monday.	June 7
Alumni Day...............................	Tuesday.	June 8
Commencement............................	Wednesday.	June 9

SUMMER VACATION.

Examinations for Admission................	Monday.	September 13
First or Fall Term begins..................	Wednesday.	September 15



LEARNING AND LABOR.

CATALOGUE AND CIRCULAR

OF THE

UNIVERSITY OF ILLINOIS,

URBANA, CHAMPAIGN COUNTY, ILL.

1885-86.

CHAMPAIGN, ILL:
GAZETTE STEAM PRINT.

1886.

BOARD OF TRUSTEES.

FACULTY.

SELIM H. PEABODY, Ph. D., LL. D.,
REGENT, and Professor of Mechanical Engineering.

THOMAS J. BURRILL, M. A., Ph. D.
Professor of Botany and Horticulture, and Vice-President.

SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics.

EDWARD SNYDER, M. A.,
Professor of Modern Languages.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.,
Professor of History and Ancient Languages, and Secretary.

GEORGE E. MORROW, M. A.,
Professor of Agriculture.

PETER ROOS,
Professor of Industrial Art and Designing.

IRA O. BAKER, C. E.,
Professor of Civil Engineering.

WILLIAM McMURTRIE, E. M., Ph. D.,
Professor of Chemistry and Mineralogy.

STEPHEN A. FORBES, Ph. D.,
Professor of Entomology and Zoology.

CHARLES McCLURE,
Second Lieut. 18th Infantry, U. S. A.,
Professor of Military Science and Tactics.

THEODORE B. COMSTOCK, B. S.,
Professor of Mining Engineering.

JAMES H. BROWNLEE, M. A.,
Professor of Rhetoric and Oratory.

CHARLES W. ROLFE, M. S.,
Assistant Professor of Natural History.

ARTHUR T. WOODS,
Assistant Engineer, U. S. N.,
Assistant Professor of Mechanical Engineering.

ARTHUR N. TALBOT, C. E.,
Assistant Professor of Engineering and Mathematics.

DONALD McINTOSH, D. V. S.,
Lecturer in Veterinary Science.

EDWIN A. KIMBALL,
Instructor in Iron-work, and Foreman.

GEORGE W. PARKER,
Instructor in Wood-work, and Foreman.

JOSEPHINE A. CASS, B. A.,
Instructor in Ancient Languages.

HELEN B. GREGORY, B. A.,
Instructor in Modern Languages.

SAMUEL W. STRATTON,
Instructor in Mathematics.

KITTIE M. BAKER,
Teacher of Vocal and Instrumental Music.

GEORGE C. HEWES, B. S.,
First Assistant in Chemical Laboratory.

DWIGHT H. BARRETT,
Second Assistant in Chemical Laboratory.

WILLIAM H. GARMAN,
Assistant in Zoological Laboratory.

THOMAS F. HUNT, B. S.,
Assistant in Agriculture.

A. B. BAKER,
Janitor.

State Laboratory of Natural History.

STEPHEN A. FORBES, Ph. D.,
Director and State Entomologist.

THOMAS J. BURRILL, Ph. D.,
Botanist.

WILLIAM H. GARMAN,
First Assistant.

CLARENCE M. WEED, B. S.,
Entomological Assistant.

CHARLES F. HART,
Assistant.

MARY J. SNYDER,
Stenographer.

CORA M. MALTBY,
Librarian.

LIST OF STUDENTS.

Resident Graduates.

NAME.	RESIDENCE.
Clark, Chas W	St. Louis.
Vial, Fred K, B. S.	Western Springs.
Woodworth, Chas W, B. S.	Champaign.

Senior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Babcock, William A	Literature and Science	Ipava.
Bannister, George S	Architecture	Odell.
Barrett, Dwight H	Chemistry	La Moille.
Bullard, S Foster	Architecture	Springfield.
Chitty, William L	Literature and Science	Metamora
Courtney, Alonzo	Civil Engineering	Milford.
Cromwell, John C	Mechanical Engineering	Frankfort, Ky.
Davis, James O	Civil Engineering and Mil.	French Grove.
Dodds, Joseph C	Literature and Science	Sadorus.
Endsley, Lee	Literature and Science	Milford.
Everhart, T Ward B	Ancient Languages	Champaign.

NOTE.—A star (*) indicates that a student has not secured the full number of credits belonging to the class in which he is enrolled. He may have fallen behind this class, or he may have advanced beyond the class below.

NAME.	COURSE.	RESIDENCE.
*Fargusson, Mark	Civil Engineering and Mil.	Chicago.
Fulton, James	Civil Engineering	Eureka.
Garrett, James H	Mechanical Engineering	Ashton
Garvin, John B	Natural History	Morristown, N.Y.
Harris, James W	Civil Engineering	Elburn.
Hubbard, Harry T	Literature and Science	Urbana.
Jacobson, Jacob S	Architecture	Chicago.
Kammann, Charles	Literature and Science	Mascoutah
Lemme, Emil	Architecture	Davenport, Ia.
Lumley, Clinton G	Literature and Science	Ringwood.
Morse, Henry M	Mechanical Engineering	Cazenovia.
Olshausen, W A G	Civil Engineering	Davenport, Iowa.
Pence, William D	Civil Engineering and Mil.	Columbus, Ind.
Philbrick, Alvah	Civil Engineering and Mil.	Champaign.
Plowman, William L	Literature and Science	Virden.
*Powers, Mark	Chemistry	Fayetteville, Mo.
Sargent, Charles E	Mechanical Engineering	Carlinville.
Shlaudeman, Harry	Architecture	Decatur.
*Taylor, Horace		Nokomis.
Thompson, Luther	Civil Engineering and Mil	Bement.
Whitmire, Z Lincoln	Literature and Science	Metamora.
Wilder, Henry W	Ancient Lang. and Mil.	Champaign.

LADIES.

NAME.	COURSE.	RESIDENCE.
Ayers, Belle	Literature and Science	Urbana.
Elder, Nettie	Literature and Science	Urbana.
Ermentrout, A Mae	Literature and Science	Urbana.
Fairchild, Rozina P	Literature and Science	Metamora.
Huff, Bertie	Literature and Science	Champaign.
Jaques, Minnie	Literature and Science	Urbana.
Parminter, Grace E	Literature and Science	Metamora.

Junior Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Barclay, William	Civil Engineering	East Wheatland.
Blake, John B	Mechanical Engineering	Lombard.
Bunn, Frank W	Mechanical Engineering	Sterling.

NAME.	COURSE.	RESIDENCE.
Cantine, Edward I	Civil Engineering and Mil	Bloomington.
Clark, Percy L	Chemistry	Elgin
Connett, Oliver	Civil Engineering and Mil.	Champaign.
Dryer, Ervin	Mechanical Engineering	Champaign.
Fink, Bruce	Natural History	Aurora.
*Gaskell, Beattie E	Chemistry	Mascoutah.
Gilbert, Frank M	Mechanical Engineering	Bryan, Texas.
Gill, Rudolph Z	Architecture	Urbana.
Goodwin, Phil A	Civil Engineering and Mil.	Wilmington.
*Greg ry, Grant	Literature and Science	Champaign.
Henson, Charles W	Mechanical Engineering	Chicago.
Johnson, Edward S	Civil Engineering and Mil.	Milan.
*Keeslar, John W	Literature and Science	Danville.
Lloyde, Clarence A	Mechanical Eng. and Mil.	Champaign.
Long, Frank B	Architecture	Virden.
Lyman, Henry M	Mechanical Eng. and Mil.	Lemont.
Millar, W Edwin	Civil Engineering	Mattoon.
*Mitchell, Walter R	Natural History	Bement.
*Moffett, Ocea E	Literature and Science	Modesto.
Moore, Albert C	Literature and Science	Polo.
*Richards, Albert L	Mechanical Engineering	Burton.
*Scott, John A	Literature and Science	Champaign.
*Spear, Grant W	Mechanical Engineering	Aurora.
*Tatarian, Bedros	Chemistry	Constantinople, Turkey.
*Taylor, John W	Civil Engineering	Charleston.
Waite, Merton B	Natural History and Mil.	Oregon.
*Willard, Reuel	Mechanical Engineering	Wilmington.
Williams, Herbert B	Mining Engineering	Farm Ridge.

LADIES.

NAME.	COURSE.	RESIDENCE.
*Eisenmayer, Ida	Literature and Science	Mascoutah.
*Eldridge, Mary A	Literature and Science	Galva.
*Folger, Ida	Literature and Science	Ridge Farm.
*Gayman, Angelina	Literature and Science	Champaign.
Jillson, Sallie R	Literature and Science	Champaign.
*Mathers, Effie	Natural History	Mason City.
*Rhinesmith, Beulah	Literature and Science	Bement.
Williamson, Mary H	Literature and Science	Urbana.

Sophomore Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
*Baker, Frank D	Mechanical Engineering	Wilmington.
*Barber, William D	Mechanical Eng. and Mil.	Champaign.
Beadle, J Grant	Architecture	Kewanee.
Bing, Benjamin	Chemistry	Urbana.
*Bopes, Charles	Agriculture	Hamlet.
Bowditch, Fred D	Literature and Science	Burnsville, N. C.
*Bowsher, C A	Civil Engineering	Barnett.
Bryant, Wm C	Architecture	Holton, Kansas.
Bush, Lincoln	Civil Engineering	Orland.
Cheedle, Harry	Mechanical Eng and Mil.	Metamora.
*Davis, Frank L	Architecture	Latham.
*Dewey, Ralph E	Literature and Science	Penfield.
Dose, Henry F	Civil Engineering	New Athens.
Ellison, Edward E	Civil Engineering and Mil.	Marine.
Fischer, J George	Mechanical Engineering	Oregon.
*Folger, Adolphus	Natural History	Ridge Farm.
Frederick, Grant	Literature and Science	Clarence.
*Fulton, Perry A	Agriculture	Warsaw.
*Goldschmidt, A G	Mechanical Engineering	Davenport, Ia.
Goldschmidt, E W	Mechanical Engineering	Davenport, Ia.
*Goodell, Nathan P	Literature and Science	Loda.
*Grindley, Harry S	Agriculture	Champaign.
Hadra, Fritz	Literature and Science	Austin, Texas.
*Irving, Frank T	Architecture	Jacksonville.
*Jones, Harry	Mechanical Engineering	Parnell.
*Ligare, Edward F	Mining Engineering	Glencoe.
McHugh, George B	Chemistry	Urbana
*Meneley, Chas W	Literature and Science	Champaign.
Moles, Oliver S	Literature and Science	Brimfield.
Myers, George W	L. and S. and Mil.	Urbana
*Napper, S T	Agriculture	Scales Mound.
Patton, Jacob A	Chemistry and Military	Charleston.
Pickard, Edward W	Ancient Lang. and Mil.	Urbana.
*Place, Raymond M	Literature and Science	Atlanta.
Rinaker, John I, jr	Architecture	Carlinville.
Roberts, Warren R	Civil Engineering	Sadorus.
Samuels, J H	Mechanical Eng. and Mil.	Moline.
Sanford, Willard C	Chemistry	Marengo.

NAME.	COURSE.	RESIDENCE.
Tannatt, Eben T	Mechanical Eng. and Mil.	Walla Walla, W T
Tossey, Francis J	Literature and Science	Toledo.
*Troyer, William L	Agriculture	Dorchester, Neb.
Vance, Boyle	L. and S and Mil.	Paris.
Van Gundy, Chas P	Chemistry	Springfield.
*Wikoff, Frank J	Mechanical Engineering	Metamora.

LADIES.

NAME.	COURSE.	RESIDENCE.
Barnes, Mary Lena	Literature and Science	Champaign.
Beach, Etta L	Literature and Science	Champaign.
*Connett, Ella	Literature and Science	Champaign.
Dewey, Helena M	Literature and Science	Penfield.
Jillson, Nellie W	Literature and Science	Champaign.
McLean, Nellie	Literatnre and Science	Urbana.
*McLellan, Mary C	Literature and Science	Champaign.
McWilliams, M E	Literature and Science	Champaign.
*Paine, Leanah J	Literature and Science	Orizaba.
*Pearman, Minnie A	Literatnre and Science	Champaign.
Price, Kate C	Literature and Science	Champaign.
*Ranney, Esther J	Literature and Science	Cazenovia.
*Stoltey, Ida M	Literature and Science	Champaign.

Freshman Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
*Aquilera, Rodrigo	Civil Engineering	Parral, Mexico.
*Beatty, Wilbur M	Civil Engineering	Centerburg, O.
Bennett, Cleaves	Ancient Languages	Mattoon.
Bennett, Fred'k M	Literature and Science	Atlanta.
Briggs, Charles W	Chemistry	Champaign.
Buell, Charles C	Literature and Science	Rock Falls.
Butler, Lawrence P	Mechanical Eng. and Mil.	Rock Island.
Carver, Albert	Natural History and Mil.	Springfield.
Chester, Thaddeus P	Agriculture	Champaign.
Coen, George W	Natural History	Washburn.
Dunaway, Horace	Civil Engineering	Ottawa.
Dunshee, Geo W	Agriculture	Thomson.
Evans, Rolla W	Architecture	Bloomington.
*Galloway, Homer A	Literature and Science	Aledo.
Greaves, George	Mining Engineering	Aurora.

NAME.	COURSE.	RESIDENCE.
*Hay, Leon	Agriculture	Kankakee.
Holly, William D	Mechanical Engineering	Granville.
*Howland, H N	Mechanical Engineering	Ottawa.
*Jurado, Miguel	Agriculture	Parral, Mexico.
Kendall, Harry F	Literature and Science	Newton.
*Kinkead, David R	Civil Engineering	Earlville.
Lewis, Almon	Architecture	Joliet.
Lewis, Edward R	Civil Engineering	Champaign.
*McConney, Robt B	Mechanical Engineering	Sadorus.
*McClain. Charles	Chemistry	Urbana.
Means, William E	Chemistry and Military	Peru.
Moles, John W	Literature and Science	Brimfield
*Morse, Rollin H	Agriculture	Gifford.
Mueller, Adolph	Mechanical Engineering	Decatur.
Nance, Charles H	Chemistry	Kewanee.
Niles, Willie E	L. and S. and Mil.	Tonica.
*Parker, Charles A	Mechanical Engineering	Champaign.
*Parker, Harry	Architecture	Princeton.
Parker, Orson S	Literature and Science	Oswego.
Piatt, Herman	Ancient Languages	Lincoln.
Price, Will H	Mechanical Engineering	Champaign.
*Renner, Enos H	Literature and Science	Champaign.
Ross, Luther S	Natural History	Reno.
Rounds, Wm P	Civil Engineering	Chicago.
Rusk, William H	Literature and Science	Champaign.
Scott, Herman R	Literature and Science	Sedalia, Mo.
*Shank, John A	Mechanical Engineering	Paris.
*Shriver, Alonzo L	Mechanical Engineeiing	Champaign.
*Spafford, Frank S	Mechanical Eng. and Mil.	Morrison.
*Stanton, Edwin M	Ancient Languages	Springfield.
Steele, Philip	Mechanical Eugineering	Pittsford, Vt.
Stewart, Edward S	Literature and Science	Woodstock.
Talbot, George S	Civil Engineering	Cortland.
Tieken, Theodore	Chemistry	Coatsburg.
*Troyer, Albert M	Agriculture	Dorchester, Neb.
*Victor, Edward R	Mechanical Engineering	Champaign.
Walker, Arthur E	Chemistry	Champaign.
Walker, Robert G	Architecture	Springfield.
*Walter, Benjamin F	Mechanical Engineering	Maroa.
Warren, John B jr	Mechanical Eng. and Mil.	Hyde Park.
Weis, Herman L	Mechanical Engineering	Tonica.

LADIES.

NAME.	COURSE.	RESIDENCE.
Weston, Nathan A	Literature and Science	Champaign.
Bardwell, Ellen M	Literature and Science	Champaign.
Boyle, Annie C	Literature and Science	Champaign.
Bronson, Lilly O	Chemistry	Urbana.
Church, Blanche A	Literature and Science	Atlanta.
Coffeen, Amy	Literature and Science	Champaign.
*Hodges, Fanny E	Literature and Science	Champaign.
Paine, Sarah M	Natural History	Orizaba.
Shattuck, Anna F	Literature and Science	Champaign.
*Sim, M Eva	Literature and Science	Urbana.
Smith, Grace C	Literature and Science	St Louis, Mo.
Sparks, Myrtle E	Ancient Languages	Champaign.
Stewart, Lulu	Literature and Science	Champaign.
*Willis, Mary B	Literature and Science	Champaign.

Preparatory Class.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Adams, Alonzo T	Mechanical Engineering	Marseilles.
Allison, Lester T	Literature and Science	Arlington Hts.
Baird, Walter M		Pierre, Dakota.
Barnard, James E	Agriculture	Peru.
Batchelder, S E	Agriculture	Warrensburg.
Beachem, Charles	Literature and Science	Gifford.
Beard, Wm A		Virginia.
Benson, Edward M		Colfax.
Berry, A Lincoln	Chemistry	Dawson.
Bevis, Philemon	Architecture	Virginia.
Blackburn, Jas M	Chemistry	Paris.
Boecklyn, Werner	Civil Engineering	Burlington, Ia.
Brannan, Michael P		Savoy.
Buchanan, Albyn	Literature and Science	Springfield.
Bulpin, Thomas W	Civil Engineering	Chicago.
Bunton, Fred L	Mechanical Engineering	Kewanee.
Busey, Samuel	Chemistry	Champaign.
Campbell, Mich'l K	Literature and Science	Lewistown.
Carpenter, T S	Agriculture	Na-au-say.
Carr, Charles W		Argenta.
Chapman, Arms S	Literature and Science	Danforth.
Clark, Frank H	Mechanical Engineering	Urbana.

NAME.	COURSE.	RESIDENCR.
Clark, Thomas A	Literature and Science	Champaign.
Clarke, Herbert B	Mechanical Engineering	Peoria.
Coen, Edward	Natural History	Washburn.
Cunningham, Geo	Chemistry	Champaign.
Davis, Elmer E	Literature and Science	French Grove.
Delaney, Edward L	Literature and Science	Macomb.
Donoghue, John T	Literature and Science	La Salle.
Dunaway, Alfred	Architecture	Ottawa.
Dunlap, Harry L	Literature and Science	Paxton.
Eberhart, Noble M	Natural History	Chicago Lawn.
Fairchild, James D		Springfield.
Flanigan, Wm T	Agriculture	White Heath.
Fletcher, John J	Civil Engineering	Collinsville.
Forbush, Harry W	Architecture	Chicago.
Foster, Charles F	Civil Engineering	Loami.
Francis, Bruce R	Civil Engineering	Peoria.
Gibson, Charles	Mechanical Engineering	Peoria.
Gilliland, Wm M	Mechanical Engineering	Coatsburg.
Grindol, John F		Decatur.
Hall, Lyman	Chemistry	Savoy.
Hanna, James C	Civil Engineering	Wooster, Ohio.
Hanssen, G Adolph	Architecture	Davenport, Iowa.
Hertwick, Harry C		Hickman, Ky.
Hockett, Oliver	Chemistry	Paris.
Ingels, Henry G	Mechanical Engineering	Chatham.
Jackson, Wm S	Agriculture	Warsaw.
Keene, Edward S	Mechanical Engineering	Moline.
Leach, Wm R S	Agriculture	Elkhart.
Lee, James M		Argenta.
Machan, George S	Literature and Science	Argenta.
Mackay, Philip A	Chemistry	La Salle.
McCandless, H W	Mechanical Engineering	Orion.
McCluer, Hugh A		Farina.
McHugh, Austin F		Sedan, Kan.
McKee, Willie E	Mechanical Engineering	Rising.
Manny, Walter I	Literature and Science	Mound Station.
Martin, Harvey J	Chemistry	Elwin.
Meneley, Jerry B		Champaign.
Miner, Grant	Agriculture	Rising.
Moir, Alexander	Literature and Science	Oquawka.
Moir, James	Literature and Science	Oquawka.

NAME.	COURSE.	RESIDENCE.
Musgrave, Chas H	Literature and Science	Robinson.
Peoples, U J L	Architecture	AlleghanyCity Pa
Porter, Frank H	Mechanical Engineering	Jefferson, Wis.
Pound, Elbert E		Champaign.
Powell, John E	Civil Engineering	Powellton.
Pyle, Henry G		DuQuoin.
Reeves, Will H	Agriculture	Bloomington.
Robinson, Chas S	Literature and Science	Palatine.
Robison, Edgar	Agriculture	Towanda, Kan.
Roll, George W	Literature and Science	Woodland.
Ryan, James B		Virden.
Sanchez, Alejandro	Civil Engineering	Chihuahua, Mex
Sargent, Ernest T		Carlinville
Schaefer, Philemon	Civil Engineering	Parral, Mexico.
Scholfield, Thomas	Civil Engineering	Marshall.
Smith, Harry J	Mechanical Engineering	AlleghanyCity Pa
Stallings, Thomas	Literature and Science	Alhambra.
Stauduhar, Geo P	Architecture	Mahomet.
Steel, Frank M	Civil Engineering	Rock Island.
Steele, Wm H	Natural History	Sullivan, Ind.
Storer, Fred E	Civil Engineering	NebraskaCity,Nb
Thomas, Marion E	Civil Engineering	Bellmore, Ind.
Tresise, Frank J	Civil Engineering	Sharon, Pa.
Tscharner, John	Civil Engineering	Okawville.
Turner, Charles A	Natural History	Fairview
Vial, Eugene	Agriculture	Western Springs.
Whiting, Frank	Mechanical Engineering	Peoria
Wilkinson, Geo E	Mechanical Engineering	Argenta.
Young, Chas J P	Architecture	Decatur.

LADIES.

NAME.	COURSE.	RESIDENCE.
Barnes, Jessie	Literature and Science	Champaign.
Batchelder, N Jane	Chemistry	Warrensburg.
Bland, Mattie	Literature and Science	Todd's Point.
Carr, May	Literature and Science	Argenta.
Clark, Edith L	Literature and Science	Urbana.
Couse, Della F		Champaign.
Gerber, Mary		Argenta.
Godfrey, Eleanor	Literature and Science	Philo.

NAME.	COURSE.	RESIDENCE.
Heath, Maida		WhiteHeath.
Miller, Dilla	Literature and Science	Argenta.
Pyatt, M Grace	Literature and Science	Bethany.
Skehan, Susan B	Natural History	Cobden.
Stimpson, Edwina	Literature and Science	Onarga.
Throckmorton, C L	Literature and Science	Harvey's, Pa.
Webber, Grace	Literature and Science	Urbana.

Specials.

GENTLEMEN.

NAME.	COURSE	RESIDENCE
Corkey, T W	Veterinary Science	Urbana
Cyrus, Augustus	Agriculture	Galva.
Dement, Charles S	Art and Design	Chestnut.
Gillette, Clarence P	Natural History	Lansing, Mich.
Robertson, Charles	Natural History	Carlinville
Sallee, Lewis F	Natural History	York, Neb.
Seiler, Jacob E	Agriculture	Mt Carmel.
Stevens, Fred W	Agriculture	Odell.
Truesdale, Ralph N	Architecture	Peoria

LADIES.

NAME.	COURSE.	RESIDENCE.
Blanchard, Helen	Art and Design	St. Joseph, Mo.
Dana, Essie G	Art and Design	Champaign.
Jillson, Lizzie S	Art and Design	Champaign
Lindley, May	Art and Design	Philo.
McElroy, Mary	Chemistry	Champaign
Moore, Lutie T	Art and Design	Champaign.
Rogers, Alice D	Art and Design	Urbana

SUMMARY.

By Classes.	Gentlemen.	Ladies.	Total.
Resident Graduates	3		3
Seniors	33	7	40
Juniors	31	8	39
Sophomores	44	13	57
Freshmen	56	14	70
Preparatory	92	15	107
Special 10)	9	7	16
Total	268	64	332

By Courses.	Gentlemen.	Ladies.	Total.
Agriculture	25		25
Mechanical Engineering	53		53
Civil Engineering	43		43
Mining Engineering	3		3
Architecture	24		24
Chemistry	24	3	27
Natural History	15	3	18
Art and Design	2	6	8
English and Modern Languages	55	47	102
Ancient Languages	6	1	7
Not Specified	16	3	19
	266	63	329
Resident Graduates	3		3
Total	269	63	332

University of Illinois.

HISTORY.

The University of Illinois had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 were donated by Champaign county in bonds, buildings, and farms. The State also has made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and schools have been added as required, until four Colleges, including eleven distinct Schools, have been organized.

The whole number matriculated as students since the opening is 2,025. The number graduated from the several Colleges, including the class of 1885, is 447. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a Fine Art Gallery was established. In 1876 the University received from the Centennial Exposition at Philadelphia, three diplomas and a medal. In 1877 its exhibit at the Paris International Exposition gained a diploma and the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago,

at the junction of the Illinois Central, the Indiana, Bloomington and Western, and the Wabash railways. The country is a region of beautiful rolling prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments, embraces about 623 acres, including stock farm, experimental farm, orchards, nurseries, forest plantation, arboretum, ornamental grounds, and military parade grounds.

The University buildings, fifteen in number, include a grand Main Building, a spacious Mechanical Building and Drill Hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, two dormitories, three dwellings, two large barns, and a green-house.

The Main University Building, designed wholly for public uses, occupies three sides of a quadrangle, measuring 214 feet in front and 122 feet upon the wings. The Library wing is fire proof, and contains in spacious halls the Museum of Natural History, the Library, the Art Gallery, and the Museum of Engineering. The Chapel wing contains the Chapel, the Physical Laboratory and Lecture Room, and rooms for draughting and drawing. In the main front are convenient class-rooms; on the upper floor, elegant halls for literary societies. The building is warmed by steam from a boiler-house which forms the fourth side of the quadrangle in the rear.

The Mechanical Building and Drill Hall is of brick, 126 feet in length, and 88 feet in width. It contains a boiler-room, a machine shop, furnished for practical use with a steam engine, lathes, and other machinery; pattern and finishing shop; shops for carpentry and cabinet-work, furnished with wood-working machinery; paint and draughting rooms, and rooms for models, storage, etc. An addition built lately for a blacksmith shop, 32 by 36 feet, contains sixteen forges with anvils and tools, and a cupola for melting iron. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry or a section of a battery of field artillery. It is also supplied with gymnastic apparatus. One of the towers contains an armorer's shop and an artillery room; the other contains a printing office and editor's room.

The Chemical Building erected in 1878, at a cost, including furniture, of $40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at $400,000, the University owns 20,000 acres of well selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and County bonds amounting to $337,000.

Museums and Collections.

The Museum of Zoology and Geology occupies a hall 61 by 79 feet, with a gallery on three sides, and is completely furnished with wall, table, and alcove cases. It already contains interesting and important collections, equaled at few, if any, of the colleges of the West. They have been specially selected and prepared to illustrate the courses of study in the school of natural history, and to present a synoptical view of the zoology of the State.

Zoology.—The mounted *mammals* comprise an unusually large and instructive collection of the ruminants of our country, including male and female moose and elk, bison, deer, antelope, etc.; and, also, several quadrumana, large carnivora and fur-bearing animals, numerous rodents, and good represenitive marsupials, cetaceans, edentates, and monotremes. Fifty species of this class are represented by eighty specimens.

The collection of mounted *birds* (about five hundred specimens of two hundred and forty species) includes representatives of all the orders and families of North America, together with a number of characteristic tropical forms. Many of these specimens are excellent examples of artistic taxidermy. A series of several hundred unmounted skins is available for the practical study of species.

The set of *skeletons* contains examples of all the orders of mammals and birds except Proboscidea, together with typical representatives of the principal groups of reptiles, amphibians, and fishes.

The *cold-blooded vertebrates* are also illustrated by a very useful collection of alcoholic specimens, plaster casts, and mounted skins of the larger species, both interior and marine.

Conchology is illustrated by several thousand shells belonging to seventeen hundred species; together with alcoholic specimens of all classes and orders. The collection of Illi-

The *entomological cabinet* contains about three thousand species (principally American) named, labelled, and systematically arranged. The *lower invertebrates* are represented by several hundred dried specimens and alcoholics, and by a large series of the famous Blaschka glass models.

Geology.—The geological collection comprises many of the largest and most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the mollusks, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils from Germany, and collections, suitably arranged for practical study from this and other States, illustrate the different formations. There is a good collection of foot-prints from the Connecticut river sand-stones.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species. The recent establishment at the University of the office of the State Entomologist of Illinois makes available to students of this subject the entomological library and the collections of that office, and affords an extraordinary opportunity for observation of the methods of work and research in economic entomology.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of grasses and sedges. There are, besides, many other North American plants and some exotics. A collection of Fungi, includes a very full set of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees, well illustrates the varieties of native wood. The trees and shrubs of Stephenson county, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystalized; these, with a complete set of imported models, fully illustrate crystalography.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs, and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of Mechanics, Pneumatics, Optics, and Electricity. Ample facilities are afforded to students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

A series of standard weights and measures from the office of the Coast and Geodetic Survey of the United States Government may be consulted at the Physical Laboratory.

A five-light Weston dynamo has lately been placed in the machine shop, and is connected with the physical and chemical laboratories for experimental purposes.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, shapers, milling-machine, drill presses, and the requisite hand tools, benches, vises, anvils, etc., for pattern-shop, blacksmith-shop, moulding-room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work-shops of the University. Important additions to the equipment

of tools and machines have been made during the last year.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, illustrating sections of mines, machinery for elevating and breaking ore, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In sculpture it embraces thirteen full-size casts of celebrated statues, including the Laocoon group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great masterpieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is shown in the work of the School of Drawing and Design of the University.

Museum of Engineering and Architecture.—A large room is devoted to the gathering of a museum of practical art, the materials for which are constantly accumulating in the various schools of science. It contains full lines of illustrations of the work of the shops; models made at the University or purchased abroad; drawings in all departments; patent-office models, etc.; samples of building materials, natural and artificial; with whatever may be secured that will teach or illustrate in this most important phase of University work; the elegant exhibit made by the University at the Centennial and Cotton Exposition at New Orleans finds a permanent abode in this apartment.

A notable feature of this collection is the gift of Henry Lord Gay, Architect, of Chicago. It consists of a model in plaster, and a complete set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first King of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was

to have been seven and a quarter million of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for political reasons. Mr. Gay's generous gift occupies the place of honor in the Museum of Engineering and Architecture.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 15,000 volumes, and additions are made every year.

The large library hall, fitted up as a reading-room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study is encouraged or required. The reading room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art. The following periodicals are regularly received:

PERIODICALS IN THE LIBRARY, 1885.

AGRICULTURAL AND HORTICULTURAL.

Prairie Farmer.
Western Rural.
Country Gentleman.
Breeder's Gazette.
Indiana Farmer.
New England Farmer.
Michigan Farmer.
Farmer and Fruit-Grower.
Iowa Homestead.
Agricultural Gazette, *London.*
Gardeners' Chronicle, *London.*
American Agriculturist.
Western Agriculturist.
Live Stock Journal, monthly and weekly.
Horticulturist.
Farmers' Review.
Veterinary Journal.
Industrialist.
Poultry Keeper.
Farm, Field and Stockman.

ENGINEERING.

Encyclopedie d'Architecture, *Paris.*
Builder, *London.*
American Engineer.
Transactions American Society of Civil Engineers.
Engineering News.
Engineering and Mining Journal.
Scientific American.
Scientific American Supplement.
Sanitary Engineer.
Van Nostrand's Engineering Magazine.
The Workshop.
American Architect.
American Machinist.
Western Manufacturer.
Gazette of Patent Office.
Mechanics.
Locomotive.
American Artisan.

SCIENTIFIC.

Annales des Sciences Naturelles, Botanique. *Paris.*
Annales des Sciences Naturelles, Zoologie. *Paris.*
Science.
Nature. *London.*
American Naturalist.

Grevillea, *London.*
Journal of Microscopical Science.
Decorator and Furnisher.
Art Amateur.
Portfolio. *London.*
Comptes Rendus. *Paris.*
Chemical News. *London.*
Journal of Chemical Society. *London.*
American Journal of Chemistry.
Annals and Magazine of Natural History. *London.*
Boston Journal of Chemistry.
Jahrbericht der Chemie. *Giessen.*
Zeitschrift fur An Chemie.
Berichte der Deutschen Chemischen Gesellschaft. *Berlin.*
Lancet. *London.*
Popular Science Monthly.
American Journal of Mathematics.
American Journal of Science and Art.
Journal of Franklin Institute.
Journal de Mathematiques.
Mathematical Quarterly.
Annals of Mathematics.
Monthly Weather Review.

LITERARY AND NEWS.

International Review.
Nineteenth Century.
Edinburg Review.
Contemporary Review.
Fortnightly Review.
North American Review.
Atlantic Monthly.
Century.
Dial.
Literary World.
American Journal of Education.
Education.
Legal Adviser.
Revue des Deux Mondes. *Paris.*
Deutsche Rundschau. *Berlin.*
Nation.
Congressional Record.
Champaign County Gazette.
Champaign County Herald.
Champaign Times.
Musical Record.
Signal.
The Rock-Islander.
Country and Village Schools.

The exchanges of the *Illini* are also free to the students in the Library.

Aims of the University.

The University is both State and National in origin. Its aims are defined by the following extracts from the laws of Congress and the State Legislature:

"Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and profession in life."—*Act of Congress 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a University in the American sense, though differing designedly in the character of some of its

Colleges from the older institutions of this country. It embraces four Colleges, which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped in the same College. The following are the Colleges and Schools :

I. COLLEGE OF AGRICULTURE.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering. School of Architecture.
School of Civil and Mining Engineering.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry. School of Natural History.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages.
School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science. School of Art and Design.

Vocal and Instrumental Music are also taught, but not as parts of any regular course.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required : that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. Candidates for a degree must take the course of study prescribed for that degree.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study at least from the following list:

Physics, Chemistry, Mineralogy, Physiography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology; Drawing and Designing, Mathematics, Surveying; Elements of Agriculture and Horticulture, Vegetable Physiology, Agricultural Chemistry, Agricultural Engineering and Architecture, Animal Husbandry, Rural Economy, Landscape Gardening, History of Agriculture, Veterinary Science; Architectural Drawing and designing, Elements of Construction, Graphical Statics, History and Esthetics of Architecture, Estimates, Mining Engineering, Metallurgy, Analytical Mechanics, Geodesy, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Roads and Railroads, Construction and Use of Machinery, Modeling and Patterns, Bridges, Stone Work, Astronomy; Military Science, Political Economy, Logic, and Mental Science.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, on the two days previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography, and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical qualities; Geometry, plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, English Rhetoric and Composition. These are required, in addition to the subjects specified in 1 and 2, for candidates for the Colleges of Agriculture, Engineering, and Natural Science.

4. Physiology. Botany, Natural Philosophy; Latin Grammar and Reader, Cæsar, Cicero, Virgil, and Latin Prose Composition, in addition to 1 and 2, for School of English and Modern Languages.

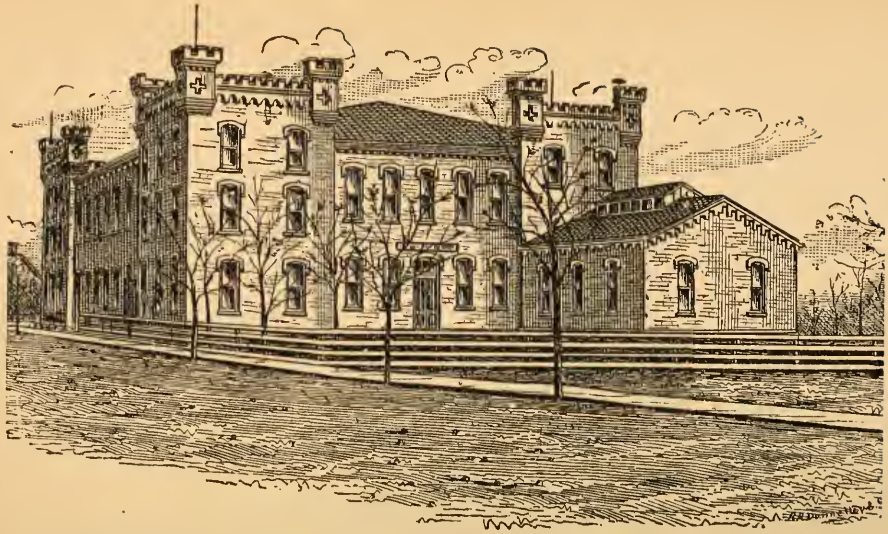
5. Latin (as in 4). Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition in addition to the subjects of 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also, "*Preliminary year.*"

COUNTY SUPERINTENDENTS' CERTIFICATES.

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of Schools will be furnished with questions and instructions for the examination of candidates in the four common branches, Arithmetic, Geography, English Grammer, and History of the United States; applicants who pass creditably will, when they present the superintendent's certificate to that effect, be admitted to the classes of the Preliminary year.



DRILL HALL AND MACHINE SHOP.

College of Agriculture.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, Ph. D.; LL. D., Regent.
GEORGE E. MORROW, A. M., *Dean*, Agriculture.
THOMAS J. BURRILL, A. M., Ph. D., Botany and Horticulture.
SAMUEL W. SHATTUCK, A. M., C. E., Mathematics.
EDWARD SNYDER, A. M., Modern Languages.
JOSEPH C. PICKARD, A. M., English Language and Literature.
PETER ROOS, Industrial Art.
WILLIAM McMURTRIE, E. M., Ph. D.. Chemistry.
STEPHEN A. FORBES, Ph. D., Entomology and Zoology.
CHARLES McCLURE, Lt. U. S. A., Military Science.
JAMES H. BROWNLEE, A. M., Rhetoric and Oratory.
CHARLES W. ROLFE, M. S., Geology.
GEORGE W. PARKER, Woodwork.
DONALD McINTOSH, D. V. S., Veterinary Science.
HELEN B. GREGORY, B. A., Modern Languages.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much

better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this College is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action, and value of the several kinds of food and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly all that man can know about soils and seeds, plants and animals, and the influences of light, heat, and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not "book farming" but a knowledge of the real nature of all true farming—of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, and Agricultural and Horticultural Associations are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to aid those who desire to avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

AGRICULTURE.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of Agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; laws especially affecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

HORTICULTURE.

Elements of Hortculture.—The following topics are discussed: Orchard sites; the age of trees to plant; the season to plant; how to plant; what to plant; the management of the soil; pruning and care of trees; gathering and preserving fruit; disease and injuries; the nursery; ornamental trees and shrubs; flower gardens; vegetable gardens, including propagating beds and houses; the vineyard and small fruits, and timber tree plantation. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history and the styles, the kinds and uses of trees, shrubs, grass, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the school. Excursions are made when found practicable, for the study of public and private grounds.

The three following studies constitute a years's work designed for those who wish to prepare themselves for special horticultural pursuits, and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which causes or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the aboretum, afford practical illustrations.

Plant-Houses and Management.—This study includes gardening and landscape architecture, the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the Anatomy and Physiology of the domestic animals are taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the students may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses; the remainder of the term to lectures on the principles and practice of Veterinary Science. During the third term practical instruction is given in clinical work, as cases present themselves, at the Veterinary Infirmary, where animals are treated or operated on free

of charge for the instruction of the students. Lectures are given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science further than is laid down in the agricultural course, will find ample facilities for so doing.

LABORATORY WORK.

Experiments and special investigations by each student. A Thesis is required, embodying the results of original observation and research.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology, and Meteorology, see statements in *College of Natural Science.*

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, furnished with all necessary apparatus. It has fine specimens of neat cattle, Short-Horns, Herefords, Holsteins, and Jerseys, Berkshire and Poland-China Swine, and Shropshiredown, Southdown, and Cotswold Sheep to illustrate the problems of breeding and feeding. The experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture, under the direction of the Professors of Agriculture and Horticulture, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several Agricultural Colleges of the country, it attempts to create a positive knowledge towards the development of an agricultural science.

The barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the hill-side barn. The barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a large windmill which furnishes power for grinding feed, and for other purposes.

A veterinary hall and stable have been provided, and a clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier mache* models of the foot and the teeth of the horse at different ages.

Surveying and drainage are illustrated by field practice, with instruments and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the College there are:

1. A very large specimen apple orchard, planted in 1869, and originally containing about 1,000 varieties—many varieties of pears, cherries, grapes, and small fruits.

2. A nursery of young trees, in which students have regular work in propagation, etc.

3. A forest tree plantation, embracing the most useful kinds of timber.

4. An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different materials and styles of laying out, give illustration to the class-room work in landscape gardening. A green-house contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in green-house management.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; *modeles clastiques* of fruits and flowers by Auzoux of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects, and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The College has a supply of compound microscopes and apparatus, and students have opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

AGRICULTURAL COURSE.

Required for the Degree of B. S., in College of Agriculture.

FIRST YEAR.

1. Elements of Agriculture; Chemistry; Trigonometry; Shop practice (optional).
2. Elements of Horticulture; Chemistry; British Authors, or Free Hand Drawing.
3. Economic Entomology; Chemistry; Rhetoric.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Botany; German.
2. Agricultural Chemistry (Soils and Plants); Zoology or Botany; German.
3. Agricultural Chemistry (Tillage, Fertilizers, Foods); Vegetable Physiology; German.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Animal Anatomy and Physiology; German.
2. Animal Husbandry; Veterinary Science; Veterinary Materia Medica (optional extra); Physics or Geology.
3. Landscape Gardening; Veterinary Science; Physics or Geology.

FOURTH YEAR.

1. Physiography; Mental Science; History of Civilization.
2. Rural Economy; Constitutional History; Logic.
3. History of Agriculture and Rural Law; Political Economy; Laboratory Work.

N. B.—Students in Horticulture will take the special branches in Horticulture described on pages 36 and 37.

FARMER'S COURSE.

Students who have not the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, may give exclusive attention to the technical Agricultural studies, including Veterinary Science, and complete these in one year.

The studies of the second, or winter term of this course, are arranged so as to be profitably studied by those who can be in attendance only during that term.

Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age. Special fee $5 per term.

The studies are taught in the following order:

1. Elements of Agriculture; Agricultural Engineering and Architecture; Animal Anatomy and Physiology; Shop Practice.
2. Animal Husbandry; Rural Economy; Veterinary Science.
3. History of Agriculture and Rural Law; Veterinary Science; Economic Entomology or Landscape Gardening.

College of Engineering.

SCHOOLS.

MECHANICAL ENGINEERING; CIVIL ENGINEERING;
MINING ENGINEERING; ARCHITECTURE.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, Ph. D., LL. D., Regent; Mechanical Engineering.
N. CLIFFORD RICKER, M. Arch., *Dean;* Architecture.
SAMUEL W. SHATTUCK, A. M., C. E., Mathematics.
EDWARD SNYDER, A. M., Modern Languages.
JAMES D. CRAWFORD, A. M., History.
PETER ROOS, Industrial Art and Design.
IRA O. BAKER, C. E., Civil Engineering.
WILLIAM McMURTRIE, E. M., Ph. D., Chemistry.
CHARLES McCLURE, Lt. U. S. A., Military Science.
THEODORE B. COMSTOCK, B. S., Mining Engineering.
JAMES H. BROWNLEE, M. A., Rhetoric and Oratory.
CHARLES W. ROLFE, M. S., Geology.
ARTHUR T. WOODS, Asst. Eng., U. S. N., Mechanical Engineering.
ARTHUR N. TALBOT, C. E., Engineering and Mathematics.
EDWIN A. KIMBALL, Iron Work.
GEORGE W. PARKER, Wood Work.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. "Warren's Draughting Instruments" may be used as a text book, and the drawings made on smooth paper, eight by ten inches.

STUDIES PURSUED BY ALL ENGINEERING STUDENTS.

The subjects common to all the schools in the College of Engineering will be described first; the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Trigonometry.—Plain and spherical. Fundamental relations between trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and subtangent; normal and subnormal, pole and polar, supplementary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

Advanced Algebra.—Functions and their notation; series and the theory of limits; imaginary quantities; general theory of equations.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; de-

velopment of functions; maxima and minima of functions of a single variable; differentials of an arc, plane area, surface and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc.; algebraic curves.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; in point, right line, plane, and surfaces of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differental equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degrees; applications; elements of elliptic integrals.

PHYSICS.

The course of Physics embraces the kinds of work following:

1. Recitations, five exercises a week, in which a text book is used as a guide.

2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are more effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The Department of Physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive Physical Laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, optics, and electricity from Stoehrer, of Leipsic, and Browning and Newton, of London; pneumatic and elec-

trical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electric lamp; and from Eliot Brothers, London, resistance coils, galvanometers, etc., for higher researchers in electricity.

A large dynamo, for experimental purposes, has lately been placed in the machine shop and is connected with the laboratory. Other electrical apparatus will be added at an early day.

DRAWING.

Projection Drawing.—Use of instruments in applying the elements of descriptive geometry; use of water colors; isometrical drawing; shades and shadows; perspective; drawing of machines, bridges, roofs, etc., finished by line shading, tints, and colors.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering.—Plain and ornamental alphabets; titles and title pages; round and stump writing.

Descriptive Geometry.—Problems on the point, right line, and plane; warped surfaces; perspective; shades and shadows; practical problems.

APPLIED MATHEMATICS.

Analytical Mechanics.—Polygon of forces; equations of equilibrium of moments; center of gravity; moment of inertia; acceleration, work, momentum, impact; motion of free particles; central forces; constrained motion.

Strength of Materials.—Elasticity; safe limits; shearing stress; flexure and strength of beams and columns; practical formulas

Hydraulics.—Amount of and center of pressure upon submerged surfaces; flow of liquids through orifices, weirs, pipes, and channels; distribution of water in cities.

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. It must be illustrated with such photographs, drawings, and sketches as may be needed, and embellished with a title page neatly lettered with India ink or colors. It must be upon regulation paper.

and securely bound. It will be prepared during the latter part of the fourth year, and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labelled with donors' names, and placed in the Museum of Engineering and Architecture, for the inspection of students and the illustration of lectures.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the profession of Mechanical Engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory is counted as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and by text books. Examples are given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the Mechanical Laboratory, and represents five different shops, viz.:

1—PATTERN MAKING.
2—BLACKSMITHING.
3—FOUNDRY WORK.
4—BENCH WORK FOR IRON.
5—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, the process of moulding and casting are fully illustrated.

In the 4th, there is first a course of free-hand bench work, the cold chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 5th shop, the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Fol-

lowing this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Previous to the shop work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

TECHNICAL STUDIES.

Kinematics and Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact, cams and curves in sliding contact; gear teeth; gearing chains; escapements; link work.

Prime Movers.—The theory and useful effects of turbine water wheels, and best form of the parts for high efficiency. Other water wheels and wind wheels. Application of thermodyamics in the study of heat engines. Relative economy of different engines.

Mill Work and Machinery.—Trains of mechanism studied with reference to their resistance and efficiency; best forms for transmission of power for short or great distances; forms of the parts for securing desired results in power and velocity; elastic and ultimate strength of parts.

Machine Drawing.—Working drawings of original designs; finishing in water colors, and in line shading; details for shop use, according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will

commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his design into execution, and teaches him so to shape, porportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

The steam engine, large drill press, one engine lathe, the hand lathes, and the milling machine, now in use, were designed here, and built in the shop by students in the department.

Besides these practical exercises, students of sufficient skill may be employed in the commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by the students. They take indicator diagrams from the engine of the Mechanical Laboratories, and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the possible defects of valve movement in distribution of steam.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schrœder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop, furnished with complete sets of tools, benches, vises, and forges, with flasks for moulding in sand, and cupola for melting iron.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

MECHANICAL ENGINEERING COURSE.

Required for the Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; German or French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; German or French.
3. Advanced Algebra; Free Hand Drawing; Shop Practice; German or French.

SECOND YEAR.

1. Calculus; Designing and Construction of Machines; German or French.
2. Advanced Analytical Geometry; Designing and Construction of Machines; German or French.
3. Advanced Calculus; Engineering Materials; German or French.

THIRD YEAR.

1. Mechanism; Analytical Mechanics; Chemistry.
2. Physics; Resistance of Materials; Chemistry.
3. Physics; Advanced Descriptive Geometry; Astronomy.

FOURTH YEAR.

1. Prime Movers; Construction Drawing; Mental Science.
2. Prime Movers; Construction Drawing; Constitutional History.
3. Mill Work; Designing and Laboratory Practice; Political Economy.

In this course the student will take two years of either French or German, but not one year of each.

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The school is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view the subjects peculiar to civil engineering are not introduced until the second year.

The instruction is given by lectures, text books, and reading, to which are added numerous problems and practical exercises, as serving best to explain subjects completely and fix them in mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete course occupies four years. The studies of the first three years will prepare students for undertaking many engineering operations, such as making land and topographical surveys, building railroads, canals, embankments, etc. The fourth year is intended to fit them for higher engineering operations, such as making geodetic surveys, building arches, trussed bridges, and supporting frames of all kinds.

The order of studies as given by the year and term in the tabular view of the course, should be closely followed, so that the student may avoid interference of hours of recitation, and because the studies are there given in the order which best meets the preparation of the student.

TECHNICAL STUDIES.

Astronomy.—Descriptive Astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and practical work with the altazimuth instrument, the astronomical transit, the sextant, and the engineer's transit adapted to astronomical calculations. It includes the instruments and their adjustment, the determination of time, latitude, longitude, and azimuth.

Bridges.—Calculation of stresses in the various forms of bridge trusses, by algebraic and graphical methods, consideration being given to weights of bridge and train, and force of wind; designing trusses and proportioning sections; details.

Geodesy.—Spirit, barometrical, and trigonometrical leveling; base lines, stations, and triangulation; parallels and meridians; projection of maps.

Land Surveying.—Areas and distances, by chain, compass, and plane table; omissions and corrections; metrical system; methods of U. S. public land surveys; magnetic variation; determination of true meridian.

Railroad Surveying.—Economic location; curves and grades, and their inter-adjustment; earth work; curvature and elevation of rail; easement curves; turnouts; crossings; maintenance of way.

Stone Work.—Stone, brick, lime, mortar, cement; foundations; retaining walls; arches, etc.

Topography.—Use of stadia, plane table, and level; contours; soundings. Sketching, mapping, conventional signs; city and county maps.

Theory of Engineering Instruments.—Examination of workmanship and design: testing instrument maker's adjustments; engineer's adjustments; determination of areas with transit; inaccessible and air line distances; profiles; heights and distances with stadia; measurement of angles with sextant, etc.

PRACTICE.

In the fall term of the second year, the class will solve numerous problems in distances, areas, etc., using the chain, compass, and plane table. During the winter term the student will have practice with all the engineering instruments, and solve problems with the transit, stadia, level, and sextant. In the spring term the class makes a careful topographical survey of a locality, using the stadia and plane table as in the United States surveys.

In the fall term of the third year the class will execute a project in railroad engineering, which will consist of preliminary surveys, location, staking out, drawings, computations of earth work, etc. The preliminary survey will consist in an examination of the locality, and in running tangent

lines, with leveling and topographical sketching. The location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings will include alignment, profile, plans, etc.

A project in geodesy or higher engineering will be executed during the fall term of the senior year. During this term the students have exercises in practical astronomy.

APPARATUS.

For Field Practice.--The school is well provided with the instruments necessary for the different branches of engineering field practice, which include chains, tape, compass, plane table, stadias, transits, levels, barometer for barometrical leveling, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observation. An astronomical observatory is provided with an equatoral telescope, an astronomical transit, with attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton & Simms, of London, is used for instruction in Geodesy and Practical Astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth.

To facilitate practice in trigonometrical and land surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including descriptive geometry and astronomy; models of bridges, roofs, joints, and connections; a large collection of drawings, photographs, and photolithographs of bridges, roofs, and engineering structures; it has access to the Museum of Engineering and Architecture, which contains models illustrating wood, stone, and metal construction, and to a complete set of lithographs of the lectures and drawings used in the government Polytechnic Schools of France.

The Library is well supplied with the latest and best periodicals and books upon engineering subjects.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S., in School of Civil Engineering.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French or German.
3. Advanced Algebra; Free-Hand Drawing; Shop Practice; French or German.

SECOND YEAR.

1. Calculus; Land Surveying; French or German.
2. Advanced Analytical Geometry; Surveying and Theory of Instruments; French or German.
3. Advanced Calculus; Topographical Surveying and Drawing; French or German.

THIRD YEAR.

1. Analytical Mechanics; Chemistry; Railroad Engineering.
2. Resistance of Materials; Chemistry; Physics.
3. Advanced Descriptive Geometry; Astronomy; Physics.

FOURTH YEAR.

1. Mine Surveying; Geodesy and Practical Astronomy; Mental Science.
2. Bridges; Stone Work; Constitutional History.
3. Geology; Bridge Construction; Political Economy.

In this course the student will take two years of German or French, but not one year of each.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory has the following position.
Latitude, 40° 6′ 29″.66.
Longitude, west of Washington, 11° 10′ 37″.5, or 44m. 42.5s.
Elevation above sea level, 720 feet.

SCHOOL OF MINING ENGINEERING.

OBJECT OF THE SCHOOL.

The school has been established to meet the growing demand of a very important industry for thoroughly trained engineers, fitted to solve the numerous perplexing problems which are constantly arising in all mining work. The subjects of the discovery, opening, economical working and proper ventilation of mines, the prevention of accidents,

transportation above and below ground, treatment of products, with many others which fall within the scope of the mining engineer, can be mastered only by a careful study of facts and principles. This is the proper foundation for the practical work of the profession, and it is the aim of this school to present this in the most complete and thorough manner.

INSTRUCTION.

It is important that a broad basis be laid by way of general preparation for the more technical studies here included. Whatever of general culture the student may obtain before entering the University, will not come amiss, and, although the requirement is not made, it is advised that all who can do so should acquire a reading knowledge of French or German before beginning this course.

The course comprises the greater part of the pure and applied mathematics of the courses in Mechanical and Civil Engineering. Much time is devoted to Chemistry and Geology, with the addition of metallurgy and other technical studies peculiar to mining engineering.

Students who are graduated from this school are not supposed to be familiar with all the details of mine management from actual experience, but they will have obtained such a knowledge of the principles underlying all successful practice, and such a familiarity with the science of mining in all its branches, that the art may be acquired with the minimum of practice.

Lectures are given where desirable, but these are to be regarded as supplementary to other modes of instruction which are made to conform as closely as possible to the routine of the engineer in practice. In every detail the student is made to feel that he is dealing with the actual problems which he will meet in his professional work.

Plans, estimates, drawings, reports, and calculations, based upon data obtained in the student's own experience, are constantly required, and no pains is spared to familiarize each member of the class with the duties and responsibilities of every grade, from miner to manager.

COURSE OF STUDIES.

In the first two years the work is similar to that required in the course in Civil Engineering, but more time is given to

chemistry. In the third year geology and Mining Engineering, with assaying and metallurgy, take the places of special technical studies in the other engineering courses. In the fourth year, with the exception of two terms of Prime Movers taken with the students in Mechanical Engineering, and some studies of general character, the work is strictly technical.

TECHNICAL STUDIES.

Mine Surveying and Reconnoitering.—History, uses, and adjustments of instuments; solar compass and various solar attachments; practical problems involving the running of surface lines and lines under ground; connecting of surface and underground surveys; practice of U. S. deputy surveyors. Details of mine surveys, setting of bench works; lines through shafts, drifts, slopes, etc.; keeping of records, plans, etc. Surveys required to determine best locations for test borings, shafts, adits, etc.; methods of reconnoitering.

Mining Engineering.—1 Attack.—Tools, implements, machinery, and explosives, with principles governing their use. Methods of boring, sinking, and driving through hard, soft, wet, dry, loose, or compact material.

2. *Timbering.*—Objects, methods, etc.; framing, fitting, bracing.

3. *Transportation.*—Underground haulage, hoisting, use of chutes; apparatus and appliances, cars, tracks, switches, cables, cages, motive power, connections; haulage in inclines, "man-engines," etc.

4. *Drainage.*—Pumps, pumping, sumps, ditches; drainage of working shafts and inclines.

5. *Ventilation.*—Means and appliances. Importance of subject; laws of various states and countries. Discussion of fundamental principles and practical applications, with results.

6. *Buildings and Machinery.*—Hoisting apparatus, air compressors, power drills, etc.

7. *Exploration.*—To determine general character and extent of deposits in advance of development; methods and aims.

8. *Development.*—Blocking out of deposits to prove values of partly explored ground, and to prepare for further exploration.

9. Exploitation.—Laying out work; trimming of coal, ore, etc.; stoping, overhand and underhand; winzes and intermediate levels; economical handling of product. Methods to be employed under various conditions.

10. Dislocations.—Faults, upthrows, downthrows, feeders, leaders, rolls, swells, etc. Means of overcoming difficulties.

Dressing of Products.—Coal screening and washing; sampling, and grading ore; assorting, crushing, spalling, cobbing; concentrating.

Mining Machinery.—Elements of construction, designing of plant, combining of parts; setting, arranging, adjusting. Preservation and operation, general economy.

Organization.—Economy of management. Secondary superintendence; division of labor and adjustment of responsibility. Prevention of accidents.

Administration.—Review of principles. System of reports from sub-officers and tabulation of records. Accounts, forms, analysis, pay-rolls, cost sheets, etc. Letting and measuring contracts. Miscellaneous details.

Engineering Geology.—Applications of geology to engineering and mining. Nature and distribution of deposits of economic value, as coal, water, metallic ores, etc.; advanced structural geology and lithology; discussion of principles underlying successful working of mines, placing of foundations, setting of machinery and erection of structures in various situations. Relation of geological structure to drainage, economy of working, selection of points of attack, methods of exploration, etc.

APPARATUS.

The department has a valuable collection of models of mining and metallurgical machinery, and new material will be added as fast as the development of the school will require, and the funds furnished will permit.

The extensive apparatus and collections in other departments are available, and these comprise a large amount of material which is useful for this purpose.

COURSE IN MINING ENGINEERING.

Required for the Degree of B. S. in School of Mining Engineering.

FRESHMAN YEAR.

1. Trigonometry; Projection Drawing; Chemistry; French or German.
2. Analytical Geometry; Descriptive Geometry and Lettering; Chemistry; French or German.
3. Advanced Algebra; Free-Hand Drawing; Chemistry; French or German.

SOPHOMORE YEAR.

1. Land Surveying; Calculus; Chemistry.
2. Theory of Instruments; Advanced Analytical Geometry; Physics.
3. Topographical Surveying; Advanced Calculus; Physics.

JUNIOR YEAR.

1. Mine Surveying; Analytical Mechanics; Mineralogy.
2. Geology; Resistance of Materials; Assaying.
3. Geology; Mining Engineering; Metallurgy.

SENIOR YEAR.

1. Engineering Geology; Prime Movers; Mental Science.
2. Mining Engineering; Prime Movers; Constitutional History.
3. Mining Engineering; Mine Administration; Political Economy.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The school prepares students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and a technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent objects of the course of instruction.

The course embraces the knowledge of theory and principles of constructive details and of the ordinary routine work of office practice, so far as these can be taught in a technical school. The technical instruction is given chiefly by lectures, with reference to text books, and is illustrated by sketches, engravings, photographs, and models; practical applications are immediately made by students.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay give facility in sketching details and correct knowledge of form.

In shop practice, joints in carpentry and joinery, cabinet making, turning, metal and stone work, are executed; also models at reduced scale of roof and bridge trusses, ceilings, domes, and stairs.

TECHNICAL STUDIES.

Elements of Drawing.—Lectures; designs, for specified problems; outline sketches and finished drawings from casts in pencil, crayon, and charcoal.

Wood Construction.—Frames, roof, ceilings, domes, heavy frames for mills, etc., roof trusses, stairs, doors, windows, external and internal finish.

Stone Construction.—Materials, mortars and cements, walls, foundations, stone cutting, tools and modes of using.

Brick Construction.—Materials, bonds, walls, arches, vaults and domes, centerings, etc.

Iron Construction.—Uses and strength of cast and wrought iron and steel; usual forms and formulæ for columns, lintels, griders, and beams.

Tinner's Work, Slating, and Plastering.

Sanitary Construction.—Scientific principles and practical methods employed in plumbing, water supply, and drainage of buildings.

Architectural Drawing.—Finishing in line, ink, sepia, and color; working out from sketches full sets of drawings for buildings; practical perspective; shades and shadows.

Architectural Designing.—Original sketches for specific projects; one full set of drawings for buildings for specified private or public purpose.

History of Architecture.—Daily lectures and recitations on principal styles, their characteristics, construction, and decoration, making especially prominent those ideas applicable in American architecture; tracing of details; designs for special problems.

Esthetics of Architecture.—Esthetics applied to architecture and allied arts, so far as yet made practical; laying out of grounds, arrangement of plans, grouping of masses; decoration, internal and external; treatment of floors, walls, ceilings; art objects, furniture, carpets, etc. About twenty-five original designs for specified objects.

Estimates.—Methods of measurement; cost of labor and materials; estimates for specified works.

Agreements and Specifications.—Preparation of sets.

Heating and Ventilation. Usual methods, by grates, stoves, furnaces, hot water or steam apparatus; fuels, their properties, heating value, and products. Problems and applications to specified buildings.

Graphical Statics.—Elements; equilibrium polygon and its applications; roofs, loads, and wind pressures; type forms of trusses; determination of strains and dimensions of parts; details of joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such plates must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give practical knowledge of various kinds of work, three terms are occupied in a course of instruction, which all architectural students are required to pursue unless they have already had equivalent practice.

First Term.—Carpentry and Joinery. Planing flat, square, and octagonal prisms, and cylinders; framing with single, double, and oblique tenons; splices, straight, and scarfed; miter, lap, and gained joints; through and lap dovetails; mouldings, miters, and panels.

Second Term.—Turning and cabinet making; cylinders, balusters, capitals and bases of columns, vases, rosettes, etc.; fret sawing, plain and ornamental veneering; inlaying, carving, and polishing.

Third Term.—Metal work, pattern making, moulding and casting, filing and finishing, drilling, screws, hand and machine turning.

Stone work designs executed in plaster of Paris; production of plane, rule, warped, and spherical surfaces; voussoirs of arches, vaults, and domes; decorative carving.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr, of Berlin, belong to the school of Architecture and Designing; models of ceilings, roof trusses, stairs, joints, etc.; Schrœder's models of joints in stone cutting, etc.

The casts, photographs, etc., of the Art Gallery. In the library, many of the best English, German, French, and American architectural works and periodicals.

A large carpenter and cabinet shop, containing full sets of tools, for shop practice; foot lathe with slide rest, chuck, drills, etc.; cross and splitting saws; planer, moulder, tenoning machine, lathe, whittler, fret saw, etc.

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Trigonometry; Projection Drawing; Shop Practice; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Advanced Algebra; Graphical Statics; Shop Practice; French.

SECOND YEAR.

1. Elements of Wood Construction; Calculus; Free Hand Drawing and Modeling.
2. Elements of Stone, Brick, and Metal Construction; Advanced Analytical Geometry; Architectural Drawing and Designing.
3. Elements of Sanitary Construction; Advanced Calculus; Water Color Sketching.

THIRD YEAR.

1. Architectural Drawing; Analytical Mechanics; Chemistry.
2. History of Architecture; Resistance of Materials; Physics.
3. History of Architecture; Advanced Descriptive Geometry; Physics.

FOURTH YEAR.

1. Esthetics of Architecture; Architectural Perspective; History of Civilization.
2. Architectural Designing; Heating and Ventilation; Constitutional History.
3. Architectural Designing; Estimates, Agreements, and Specifications; Political Economy.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for master builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's Course must pass the examinations in the common branches, but need not pass in

the studies of the preliminary year unless they shall desire to pursue other studies than those marked in the following schedule. Special fee, $5 per term.

BUILDER'S COURSE.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making).

College of Natural Science.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, Ph. D., LL. D.: Regent.
WILLIAM McMURTRIE, E. M., Ph. D., *Dean*; Chemistry.
THOMAS J. BURRILL, M. A., Ph. D., Botany and Horticulture.
SAMUEL W. SHATTUCK, M. A., C. E., Mathematics.
EDWARD SNYDER, M. A., Modern Languages.
JAMES D. CRAWFORD, M. A. History.
PETER ROOS, Industrial Art.
STEPHEN A. FORBES, Ph. D., Entomology and Zoology.
CHARLES McCLURE, Lt. U. S. A., Military Science.
JAMES H. BROWNLEE, M. A., Rhetoric and Oratory.
CHARLES W. ROLFE, M. S., Geology.
GEORGE C. HEWES, B. S., Asst. in Chemistry.
DWIGHT H. BARRETT, Asst. in Chemistry.
W. H. GARMAN, Asst. in Zoology.
HELEN B. GREGORY, B. A., Instructor in French.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must past satisfactory examinations in the common school branches, and in the studies of the preliminary year.

Their preparation should be especially good in the scientific studies of the preliminary year. Some practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in the course.

SCHOOL OF CHEMISTRY.

This School aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and as will fit him for original research, or for the business of the druggist, pharmaceutist, and practical chemist.

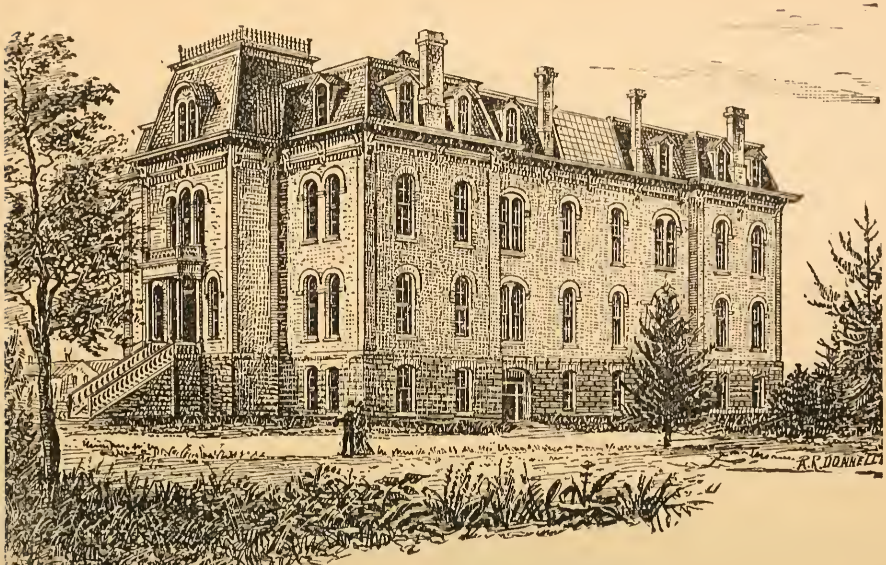
INSTRUCTION.

The first term of the first year is occupied by text-book instruction, lectures, and experiments in the laboratory, illustrating the elementary principles of chemistry, chemical physics, and inorganic chemistry. The second term is devoted to laboratory practice in qualitative analysis. In the third term recitations upon organic chemistry and illustrative synthetic experiments alternate with laboratory practice in qualitative analysis. During the next three years each student is expected to work two hours daily in the laboratory five days in the week. In order to graduate, each is required, at the end of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses, work at least two consecutive hours daily during such time as their specialties may require.

Deposits.—At the beginning of each term of laboratory practice, each student will deposit twelve dollars with the business agent of the University. At the end of the term, the balance left, after deducting payment for gas, chemicals, and apparatus used, will be refunded.

Five courses of laboratory work have been arranged, as follows:



CHEMICAL LABORATORY.

CHEMICAL COURSE.

FIRST YEAR.

First Term.—General, theoretical, and applied chemistry. Lectures, text-book, and experiments.

Second Term.—Qualitative analysis begun; tests and separation of the bases and acids.

Third Term.—Qualitative analysis completed. Examination of 20 simple salts and 20 compound substances, natural and commercial products. Organic chemistry. Text-book and recitations.

SECOND YEAR.

First Term.—Quantitative analysis of barium chloride, sodium phosphate, Rochelle salt, calcite, ammoniumferric sulphate. Volumetric analysis. Acidimetry and alkalimetry.

Second Term. Quantitative analysis. Limestone, clay, spathic iron ore, calamine, copper pyrites, tetrahedrite. Volumetric analysis of iron, zinc, etc.

Third Term.—Advanced organic Chemistry. Ultimate organic analysis. Determination of carbon, hydrogen, nitrogen, chlorine, phosphorus, and sulphur, in carbon compounds.

THIRD YEAR.

First Term.—Advanced organic Chemistry, continued. Organic Synthesis and Analysis. Preparation of Carbon compounds, and determinations of compositions and formulas.

Second Term.—Assaying. Dry assay of gold, silver, lead, and tin ores. Volumetric assay of silver, lead, copper, and zinc ores, bullion, etc. Blow pipe assays of silver ores.

Third Term.—Analysis of Soil. Valuation of commercial fertilizers —phosphates, nitrogenous matter, and alkaline salts. Analysis of milk, butter, corn, and wheat. Examination of alcoholic liquors.

FOURTH YEAR.

First Term.—Gas Analysis. Calibration of eudiometers. Analysis of air from lungs, atmospheric air, marsh gas, crude coal gas. Analysis of mineral water. Preparations.

Second Term.—Toxicology. Micro-Chemistry of Poisons. Testing for mineral and vegetable poisons. Separation from organic mixtures. Preparations.

Third Term.—Original researches. Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Quantitative analysis of commercial drugs, bismuth subnitrate, tartar emetic, sodium bicarbonate, potassium iodide, sodium bromide, ammonium carbonate, potassium nitrate, cream tartar, phosphites Volumetric determination.

Third Term.—Same as in Chemical course.

THIRD YEAR.

First Term.—Same as in Chemical course, substituting preparation and analysis of organic chemicals for analysis of urine.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs—oils, resins, gums, alkaloids, glucosides, etc.

Third Term.—Materia Medica. Reading and compounding prescriptions. Preparation and valuation of tinctures and extracts. Examination of commercial organic drugs.

FOURTH YEAR.

First Term. Analysis of urine, normal and pathological. Mineral waters. Examination of alcoholic liquors.

Second Term.—Toxicology. Micro-chemistry of Poisons. Separation of poisons from organic mixtures.

Third Term.—Original researches. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

Arranged for students desiring to make a specialty of this branch.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative analysis or barium chloride, magnesium sulphate, ammonium sulphate, calcium sulphate, dolomite, bone ash, kainit, feldspar.

Second Term.—Analysis of ashes of plants, soil, mineral waters.

Third Term.—Analysis of commercial fertilizers, manures and mineral used for manures, apatite, phosphates, guanos, nitrates.

THIRD YEAR.

First Term.—Same as in Chemical course, omitting analysis of urine. Analysis of corn, wheat, and fodder.

Second Term.—Analysis of milk, butter, cheese. Analysis of sugars by polariscope and by titration. Examination of alcoholic liquors.

Third Term.—Original researches.

COURSE IN AGRICULTURAL CHEMISTRY.

Especially arranged for students in the School of Agriculture.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Analysis of soil, ashes of plants, commercial fertilizers, manures, and materials employed in their production apatite, phosphates, guanos, animal matters, ammonia salts, nitrates, and marls.

Third Term.—Analysis of corn, wheat, hay, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Assaying.* Same as in Chemical course.

Third Term.—Analysis of calamine, spathic iron ore, magnetic iron ore, copper pyrites, galena, nickel ore, manganese ore, cinnabar, grey antimony.

THIRD YEAR.

First Term.—Analysis of slags from copper, zinc, and lead; iron furnace and mill slags.

Second Term.—Analysis of pig iron, wrought iron, steel, commercial copper, lead, zinc, bullion.

Third Term.—Analysis of fuels, wood, anthracite and bituminous coals, coke, determination of heating power. Analysis of ashes and furnace cinders; mineral waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has been erected at an expense, including furniture, of $40,000.

The basement contains a furnace room for assaying and metallurgical operation; a mill room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations.

The first story contains a lecture room capable of seating 200 persons, and a qualitative laboratory, which, when completed, will accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood, gas, and water. There are a spectroscope table, a blow pipe table for general use, and a store room stocked with apparatus and chemicals.

The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room, containing chemical balances of the manufacture of Bunge (short

*Students who take this term's work must have had a term of Minerology.

beams). Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating, to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, an inductive coil, battery, mercury, etc.; and a store room with apparatus for all kinds of work in quantitative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of areometers; a Hauy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen, and a potassium dichromate battery; a galvanometer; a spectroscope; microscopes; a gas combustion furnace for organic analysis, etc.

On the mansard floor ample provision has been made for the study of Photography.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry, General and Applied; Trigonometry; Free Hand Drawing; French.
2. Chemistry and Laboratory Practice; Conic Sections; Free Hand Drawing; French.
3. Organic Chemistry and Laboratory Practice; Free Hand Drawing; Calculus; French.

SECOND YEAR.

1. Chemistry and Laboratory Practice; Physiology or Botany; German.
2. Agricultural Chemistry and Laboratory Practice; Microscopy; German.
3. Agricultural Chemistry and Laboratory Practice; Vegetable Physiology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Practice; Mental Science; Physiography.
2. Laboratory Practice; Constitutional History; Logic.
3. Laboratory Practice; Political Economy; Geology.

Students who are candidates for the degree of B. S. in the School of Chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

A term of Photography will be provided for students who desire it; it will consist of text-book work, with recitations and daily practice.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to give a liberal scientific education. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens, and arrange them for study, and to conduct original investigations.

SPECIAL STUDIES.

Botany.—Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall term of the Sophomore year, systematic and structural Botany is continued by recitations, illustrated lectures, and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the Laboratory. Each student provides himself with suitable pencils, drawing pens, and paper, needles in handles, glass sides for mounting objects, and razor for making thin sections.

The first half of the Fall term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance, etc., together with a history of a few special plants and their products. During this time, students analyze in the Laboratory flowering plants of the more difficult orders, Compositæ, Gramineæ, etc., especially such as are

best obtained in Autumn. During the last half of the term the general morphology of plants, including vegetable anatomy and history, is studied, practical laboratory work with the microscope being the basis of the instruction. Tests are made from time to time by the use of disguised vegetable substances.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kinds of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied.

Vegetable Physiology is studied in the third term. The instruction is given by lectures or text-book, and by experimental practice. The work includes: The food of plants and its absorption and assimilation; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.; processes, peculiarities, and results of growth; relations and effects of temperature, light, gravitation, etc.; self and cross fertilization, relation of plants and insects; movements, "sleep of plants," tendrils, climbing vines, etc.; origin and development.

Throughout the course the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authorities for the facts stated.

Microscopy.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly but not exclusively devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skillful and rational use of the instrument, and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn tables, etc., are furnished by the University.

Anatomy and Physiology.—This subject is presented during the first term of the Junior year. Anatomy is taught by lectures illustrated by skeletons, manikin, models in *papier mache*, and microscopical preparations. Fresh specimens of various organs are dissected and demonstrated before the class during the term. Physiology is taught by lectures, demonstrations, and recitations from Martin's treatise, The Human Body.

Zoology.—The object of the Zoological course is primarily to give the students command of the methods of Zoological research and study, and to derive from these their distinctive discipline. The subject is taught during the whole of the Sophomore year, the course being based throughout on individual work in the Zoological laboratory, and in the field. The results thus arrived at are supplemented by lectures and demonstrations, and by the study of text.

The first term is devoted to comparative dissections of types of the great groups, and to a study of the sub-kingdoms and classes of animals; the second term to comparative histology and the elements of embryology—both based on individual work with the microscope—and the third, to the determination and description of species, to the study of life histories, and to collections, field observations, and laboratory experiments, the course closing with lectures and discussions on the final generalizations and fundamental principles of Zoological science.

The natural history students electing a Zoological subject for their term's work in "natural history laboratory," in the senior year, are furnished all necessary appliances for the pursuit of whatever subject they may select, as a piece of original work, with such guidance, oversight, and suggestion as each may seem to require.

Geology is taught during the second and third terms of the Junior year. LeConte's Geology is used as a text book. The first term is given to instruction upon the dynamical effects of water in eroding, transporting, and depositing materials; upon the action of heat as manifested in metamorphism, crystalization, consolidation, and the production of mountain folds; upon the nature and material of rocks, veins, dykes, etc., and upon the arrangement and distribu-

tion of metals and their ores. The second term is devoted to the consideration of the historic development of the earth as revealed by the study of the animals and plants entombed therein: and to a discussion of the elements of time, the system of life, the origin of species, and the antiquity of man.

Physiography, or the "study of nature," is taught by illustrated lectures during the first term of the Senior year. The subjects considered are: The origin of the earth, and its relation to other worlds; the distribution of land and water; the direction and extent of mountain chains and of ocean currents; the influences which determine the climate of any locality; the systematic distribution of animals and plants; and especially the biological position of man, and his relation to the animate and inanimate worlds around him. Anthropology is taught as a distinct part of the term's work; for this a text book used.

Entomology.—The study of Entomology, pursued during a single term of the Freshman year, is necessarily made largely empirical and practical, the subject to which it is principally directed being the place of the insect world in the general system of organic life; and, incidentally to this, the relations of insects to the interests of man.

The foundation for a knowledge of structural Entomology is laid by the discussion and detailed study of a typical insect; and for that of the orders, by a generalization of the characters of selected groups of specimens representing each.

A large part of the time is devoted to the study of the characters, life histories, habits, and economic relations of one hundred species of especially important insects. Specimens of these in their different stages, together with synopses and descriptions of the families to which they belong, are furnished the students, and the essential facts not discoverable by direct observation, are given in lectures or acquired by study of text.

Practice in field observations is given as opportunity offers, and all are taught the ordinary methods of the collection, preparation, and care of specimens, together with the approved methods of controlling the ravages of the injurious species. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school.

Besides the collections, apparatus, and entomological library of the University, the students in this course have access to the collections and library of the State Entomologist, and the practical use of the many thousand duplicate insects belonging to the office. In the field and laboratory operations of the office, an extraordinary opportunity is afforded competent students of this course to observe and assist in practical entomological work and original research.

Mineralogy.—Fourteen weeks; about six weeks are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization, is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blow pipe. A very complete collection of minerals, both American and foreign, has been furnished for this purpose.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinóis, including a very nearly complete set of the grasses; a collection of Rocky Mountain and Western plants; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C.; and others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The greenhouses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

In *Entomology* numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have increased the number to about three thousand species.

The University has about thirty compound microscopes, representing the best American and European makers.

Zoology.—The Museum is particularly fortunate in its collections in Zoology, possessing, in mounted specimens of skeletons, nearly all the ruminants of North America, and

8

representatives of all orders of mammals except Proboscidea: exhibiting fifty species by eighty mounted specimens, with numerous skeletons. In birds it represents all the families of North America, having two hundred and forty species, represented by over four hundred specimens. Its Articulates number more than three thousand specimens; its fishes, four hundred; its radiates, three hundred, and its reptiles nearly one hundred. Sea, land, and fluviatile shells are represented by seventeen hundred species. The Museum also contains nearly one hundred specimens, representing the osteology of vertebrates; a large collection of the nests and eggs of birds; a collection of Indian implements; and a manikin, a dissected eye, and a trachea, in *papier-mache*.

Geology.—The Geological Cabinet contains Prof. Ward's celebrated college series of casts of famous fossils, including the gigantic Megatherium nearly eighteen feet in length; the Elephas Ganesa with tusks ten-and-a-half feet long; the Collossochelys Atlas,—a gigantic tortoise with a shell eight feet by six; and the Plesiosaurus Cramptoni, twenty-two and a half feet. It also contains a series of tracks in the sandstone of the Connecticut river; a large collection of carboniferous ferns from the celebrated locality at Morris, Ill.; several thousand specimens of fossils from the State Geological Survey, and from purchase in Europe; and a large number of specimens illustrating building materials, dikes, veins, metamorphism, drift bowlders, etc.; about four thousand specimens, not yet arranged, have been added during the past year.

Mineralogy.—The Cabinet of Minerals consists of a valuable and extensive collection of the leads of the State, and accompanying minerals; a collection of models, comprising the most important forms and combinations in the various systems of crystallization; and a very complete collection of minerals, both American and foreign.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for the Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry; Free-Hand Drawing; Trigonometry; French.
2. Chemistry; Free-Hand Drawing; Conic Sections; French.
3. Chemistry or Free-Hand Drawing; Economic Entomology; French.

SECOND YEAR.

1. Zoology: Botany: German.
2. Zoology: Botany: German.
3. Zoology: Vegetable Physiology: German.

THIRD YEAR.

1. Anatomy and Physiology; Mineralogy; German: Ancient History (optional. extra).
2. Geology: Physics: German: Mediæval History (optional. extra).
3. Geology: Physics: Modern History.

FOURTH YEAR.

1. Physiography or Biology: History of Civilization: Mental Science.
2. Microscopy or Biology: Constitutional History: Logic.
3. Biology: Astronomy: Political Economy.

In this course three terms of University Latin will be accepted in lieu of three terms of French: and five terms of such Latin for five terms of German.

College of Literature and Science.

SCHOOLS.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.
SCHOOL OF ANCIENT LANGUAGES.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, Ph. D., LL. D.: REGENT.
EDWARD SNYDER, M. A., *Dean;* Modern Languages.
THOMAS J. BURRILL, M. A., Ph. D., Botany.
SAMUEL W. SHATTUCK, M. A., C. E., Mathematics.
JOSEPH C. PICKARD, M. A., English Language and Literature.
JAMES D. CRAWFORD, History and Ancient Languages.
PETER ROOS, Industrial Art.
WILLIAM McMURTRIE, E. M., Ph. D., Chemistry.
STEPHEN A. FORBES, Ph. D., Entomology and Zoology.
CHARLES McCLURE, Lt. U. S. A., Military Science.
JAMES H. BROWNLEE, M. A., Rhetoric and Oratory.
CHARLES W. ROLFE, M. S., Geology.
JOSEPHINE A. CASS, B. A., Ancient Languages.
HELEN B. GREGORY, B. A., Modern Languages.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology, and Botany, and the Latin mentioned belowed, but not the Greek. Notice is given that, beginning with the Fall term of 1887, students desiring to enter the College of Literature and Science must pass the

examinations in preparatory Latin before they can be matriculated. Until then students not prepared in the Latin for this School will be allowed to make up the required Latin after entering, with the aid of private tutors, but such students will be required to pass an examination in English Composition and Rhetoric.

Candidates for the School of Ancient Languages will be examined in Greek, but not in the elements of Botany, Physiology, or Natural Philosophy. The examinations in Latin and Greek will be as follows:

LATIN.

Latin Grammar, including Prosody (Harkness', or Allen and Greenough's): Latin prose composition (forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 196, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition): four books of Cæsar's Commentaries, six orations of Cicero, and six books of the Æneid. *Real equivalents* for any of the above mentioned works will be accepted.

GREEK.

Greek Grammar (Goodwin's or Hadley's) Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sounds of the vowels and dipthongs, and pronounciation according to the accent, are recommended.

OBJECT OF THE SCHOOLS.

The object of the Schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions or for the transaction of public business.

Students in the Agricultural and other Technical Schools, desiring to educate themselves as teachers, and professors, in

their special departments, require a knowledge of the ancient, as well as of modern languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through the Schools to provide for this important part of its mission—the furnishing of teachers to industrial schools of the country, and investigators and writers for the arts.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original researches, essays, criticism, and other work intended to illustrate the studies pursued, and to exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a further aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of literature and science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of, practice in English Composition should be mentioned THE ILLINI, a semi-monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided in the mechanical building, and a press with a requisite supply of type.

The *Library* is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over sixteen thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room. (See list on pages 27 and 28.)

SUBJECTS COMMON TO THE SCHOOLS OF THIS COLLEGE.

MATHEMATICS.

First Term.—Trigonometry, plane and spherical; fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; angles as functions of sides, and sides as functions of angles; applications.

Second Term.—Conic Sections, geometrical method. Definitions and general properties of the ellipse, hyperbola, and parabola; curvature of the conic sections. Analytical Geometry, elements of. Properties and relations of the point and right line in a plane; of the conic sections.

Third Term.—Differential Calculus; the differentiation of functions of a single variable; development of functions. Infinitesimals; order of an infinitesimal; the substitution of one infinitesimal for another; the limit of the ratio of two infinitesimals, the limit of the sum of infinitesimals. Integral Calculus; Formulas for direct integration and by substitution; integration by parts; simplification by transformation; area of a segment of a circle, of an ellipse, of an hyperbola; length of an arc of a circle, of a parabola, etc.

Text Books.—Coffin's Conic Sections and Analytical Geometry. Byerly's Calculus.

PHYSICS AND ASTRONOMY.

For these subjects, see College of Engineering.

NATURAL SCIENCE.

See College of Natural Science.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the Junior and Senior years of the University Course.

JUNIOR YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History: Modern History; European Geography.

SENIOR YEAR.

Constitutional History of England and the United States; History of Civilization: Analysis of Historical Forces and Phenomena, Notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department require much maturity of powers and are therefore confined to the Senior year of the University Course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental physiology, or connection of body and mind, healthful condition of thought, growth and decay of mental and moral powers. Philosophy of education, theory of conscience; nature of moral obligation; moral feeling. The Right. The Good. Practical ethics; duties. Formation of character. Ancient schools of philosophy: modern schools of philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of Logic; conditions of valid thinking; forms of arguments, fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and the formation of the habits of thinking and common judgment of life.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical languages. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read an entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts, or original compositions on themes assigned, are also required. The study of Rhetoric occupies the third term.

During the second year four or five of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on poetry, epic, lyric, dramatic, etc. Writing and reading required as in first year.

In the Senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German, and to Philology. Essays, forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease scientific and other works in these languages, and may, with a little practice write and speak them with correctness. Constant attention is also given to the etymologies common to these languages and the English, and thereby a large advantage in linguistic culture is gained by the student. "He who knows no foreign tongue," said Goethe, "knows nothing of his own."

In the first year the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select reading, composition, and conversation.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for the Degree of B. L.

FIRST YEAR.

1. American Authors or Cicero de Amicitia: French: Trigonometry.
2. British Authors or Livy: French: Conic Sections.
3. Rhetoric: French: Calculus, or Free Hand Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics: German: Physiology or Botany.
2. English Classics: German: Zoology or Botany.
3. English Classics: German: Astronomy.

THIRD YEAR.

1. German: Chemistry: Ancient History.
2. German: Physics: Mediæval History.
3. German: Physics or Chemistry: Modern History.

FOURTH YEAR.

1. Anglo-Saxon: Mental Science: History of Civilization.
2. Early English: Logic: Constitutional History.
3. Philology: Political Economy: Geology.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the School of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who comtemplates the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors

in both languages. As an aid to the appreciation of the literature of the two peoples. Greek and Roman history will form an important part of the course. and will be taken up in the beginning. illustrating the works read. In the first term of the third year Ancient History is taken up as a separate study, and especial attention is then given to the history of Greece and Rome. and the nations with whom they came in contact. Classes will be formed for the students who wish to carry their classical study further than the prescribed course, and every assistance will be given them.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition; Iliad and prose composition; Trigonometry.
2. Livy and prose composition; Odyssey and prose composition; Conic Sections.
3. Odes of Horace and prose composition; Memorabilia and prose composition; Advanced Geometry.

SECOND YEAR.

1. Satires of Horace; Thucydides or German; Physiology.
2. Terrence; Sophocles or German; Zoology.
3. Tactitus; Demosthenes or German; Astronomy.

THIRD YEAR.

1. Juvenal or French; Chemistry; Ancient History.
2. Quintilian or French; Physics; Mediæval History.
3. De Officiis or French; Physics; Modern History.

FOURTH YEAR.

1. Mental Science; History of Civilization; Physiography.
2. Logic; Constitutional History; Early English.
3. Political Economy; Philology; Geology.

DEPARTMENT OF RHETORIC AND ORATORY.

Particular attention is given to training in writing and speaking, and in the exercises of this department all students are required to participate. Such a course of instruction in Composition and Oratory is provided as makes it probable that all who complete it faithfully will be able to express their thoughts, both with voice and pen, in a clear, intelligent manner, and without affectation or embarrassment.

With the exception of the last term of the Freshman year, which is devoted to the text book of Rhetoric, the required theme—writing, extends over the first two years of the course, the remaining two being given to the art of oratory, including the principles of oral expression.

The number of themes from Freshmen is eight, and from Sophomores twelve, and each paper after correction is returned to the student to be carefully re-written. For composition the classes are divided into sections of about twenty, which meet weekly. At these meetings, questions of students are answered, the faults and merits of the essays of the preceding week are pointed out, and subjects assigned for the next week. Two lectures each term are given by the professor to the whole class, on the kind of writing involved in the next five weeks, as narration, description, argument, etc.

In oratory, the classes are also divided into sections. A critical analysis is made of some of the master-pieces of the great orators of England and America. The life and character of the orator, the circumstances that called forth the oration, his object in pronouncing it, are considered, and a study is made of his diction, sentences, paragraphs, figures of speech, etc. In addition, selections from the oration are assigned to the members of the class, which, after being well committed to memory, are carefully prepared, under the supervision of the instructor, for delivery in the presence of the whole class.

Additional Schools.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR CHARLES McCLURE,

2ND LIEUT. 18TH INFANTRY, U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the Preparatory year and of College classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firing, etc.
School of the Battalion; Ployment and Deployment of Close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is under the charge of Lieut. Charles McClure, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 ball cartridges and 1,000 blank cartridges annually for target practice, with 100 cartridges and 300 friction primers for artillery.

No student is eligible to the military class till he has reached the third term of the Freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged as far as possible so as not to interfere with any other course of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commission.—The Governor of the State is accustomed to commission as captains, by brevet, in the State militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass satisfactorily an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or Junior year will serve as commissioned officers of the several companies of the battalion.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after the first term of their attendance, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray cloth. Students can procure them ready made on their arrival here. The University cap is ornamented in front with the initials U. of I., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitation may wear other clothing.

The University Library contains many books on Military Science, Military History, and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms, under careful leaders. Fee, 50 cents.

The University Cornet Band is composed of students who, while members of the band, are excused from drill. Instruments and music are furnished by the University, and the band plays at drill, and other college exercises.

COURSE IN SCHOOL OF MILITARY SCIENCE.

FIRST YEAR.

1. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signaling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signaling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire-Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

SCHOOL OF ART AND DESIGN.

PROFESSOR PETER ROOS.

This School is to subserve a two-fold purpose: 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics, and to the skill and taste of workmen.

The increased interest in the decorative arts, and in the manufactures which they require, has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

FIRST YEAR.

1. Form Analysis and Construction; Elementary Perspective; Combination Drawing.
2. Shading from Objects; Science of Perspective; Clay Modeling.
3. Drawing from Casts; Tinted Designs; Modeling of Ornaments.

SECOND YEAR.

1. Historic Styles of Ornament; Science of Color; Mould-making and Casting in Plaster.
2. Monochrome Painting; Designs from Plants; Modeling from Shaded Examples.
3. Constructive Designs; Water Color Drawing; Modeling from Nature.

Students having passed the above course may enter either of the following courses:

COURSE IN DESIGNING.

THIRD YEAR.

1. Decoration in Historic Styles; Drawing of Common Objects; Modeling.
2. Designs for Specified Material; Study of Drapery; Art Anatomy.
3. Designs for Furniture; Water Color Drawing; Art Anatomy.

FOURTH YEAR.

1. Tempera Painting; Designs for Monuments; Modeling.
2. Drawing from Life; Designs for Memorial Windows: Modeling.
3. Ecclesiastic Decoration; Emblems and Still Life in Tempera Color; Modeling or Oil Painting.

COURSE IN PAINTING.

THIRD YEAR.

1. Drawing from Statuary; Water Color Painting; Art Anatomy.
2. Imitation of Various Stuffs and Materials; Drawing from Life.
3. Painting from Groups; Sketching from Nature; Art Anatomy.

FOURTH YEAR.

1. Drawing from Life; Composition; Painting of Still Life.
2. Painting from Life; Pictures from Description.
3. Painting from Nature; Illustration of Prescribed Subjects.

As a preparation for entering the course in Art and Design, the study of Plane Geometry and Projection Drawing is recommended.

Topics for reading upon art subjects are given weekly.

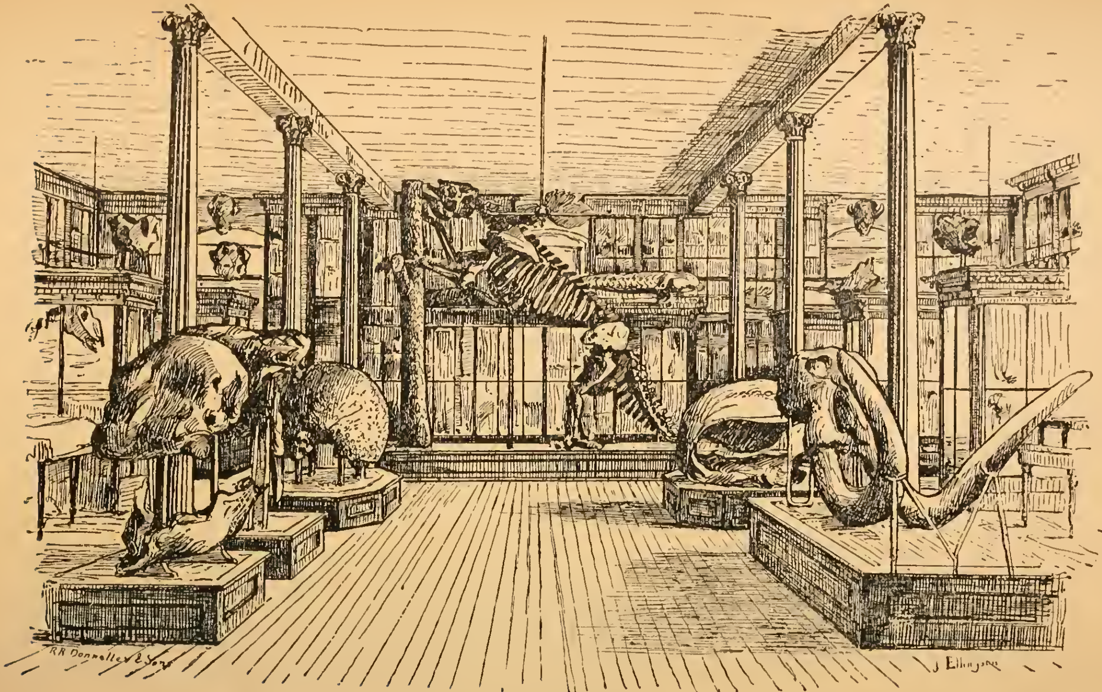
Detail Studies and Sketches such as are necessary to the successful rendering of things, will be required outside of the regular exercises.

For admission to advanced classes the student must show proficiency in preliminary work.

The authorities of the University have provided that persons not connected with the Institution may join the drawing and painting classes on very moderate terms.

MUSIC.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But as many students, especially young ladies, desire instruction in music, competent teachers are selected by the Trustees, and rooms are set apart for instruction.



MUSEUM.

COURSE OF INSTRUCTION.

Bertini's Instructor; Clementi's Sonatines, Op. 36, 37, 38; Heller's Studies, Op. 36, Books 1 and 2; Duveray's Studies, Books 1, 2, 3; Loschhorn's Klavier-Technik; Czerny's Etudes de la Velocite, Op. 299, Books 1, 2, 3, 4; Czerny's Fifty Finishing Studies, Op. 740, Books 1, 2, 3; Cramer's Studies, Books 1, 2, 3, 4; Mendelssohn's Lieder ohne Worte; Clementi's Gradus ad Parnassum.

TUITION.

Instruction, term of ten weeks—2 lessons a week	$10.00
For term of ten weeks, one lesson a week	6.00
Practice on piano. one hour daily, per term	2.00

MISS KITTIE M. BAKER,

Teacher of Vocal Music and Voice Culture, follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12.00
Ten weeks—one lesson a week	7.00

No deductions on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the preparatory studies lying between the work of the common school and that of the University.

Candidates for these classes should not be less than fifteen years old. They must pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a second grade certificate for teachers. This examination may be made by county superintendents.

PREPARATORY STUDIES.

The studies taught in the preliminary year are as follows:

FOR COLLEGES OF AGRICULTURE, ENGINEERING, AND NATURAL SCIENCE.

First Term.—Algebra.—(Olney's.) Fundamental rules; factoring; common divisors and multiples; powers and roots; calculus of radicals; simple equations; proportion and progression. *Physiology.*—(Dunglison's.) *Natural Philosophy.* (Norton's.)

Second Term.—Algebra.—Quadratic equations, etc. *Geometry.*—(Chauvenet's.) Plane Geometry, lines, circumferences, angles, polygons, as far as equality. *English.*—Elements of composition. (Kellogg's.) Orthoepy and word analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed, including solid Geometry and the sphere. *English*, as in the second term, with addition of Goldsmith's Traveler and Deserted Village, read for analysis. *Botany*—Gray's Lessons in Botany.

Reasonable equivalents for the work in any of the text books named will be accepted.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—Algebra, as above. *Latin.*—Cicero's Orations. *Greek.*—Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin.*—Virgil. *Greek.*—Xenophon's Anabasis.

Third Term.—Geometry completed. *Latin.*—Virgil's Æneid. *Greek.*—The Anabasis.

N. B.—Greek is required for only the School of Ancient Languages. The School of English and Modern Languages requires Physiology, Natural Philosophy, and Botany, instead of Greek.

Students in the preparatory studies are not matriculated as members of the University. They pay no entrance fee, but are charged a tuition fee of five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library, and of the public lectures, and are required to drill.

N. B.—No student is matriculated as a college student until all preparatory studies are completed.

ACCREDITED HIGH SCHOOLS.

The Faculty, after personal examination, appoints accredited High Schools, whose graduates may be admitted to the University without further examination within one year after date of their graduation. These must be schools of first rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

ACCREDITED HIGH SCHOOLS.

Princeton High School	Chas. Raymond,	Principal.
Lake View High School	A. F. Nightingale,	"
Champaign, West High School	M. Moore,	"
Decatur High School	John W. Gibson,	"
Urbana High School	J. W. Hays,	"
Oak Park High School	B. L. Dodge,	"
Chicago S. Division High School	Jeremiah Slocum,	"
Chicago N. Division High School	O. S. Westcott,	"
Chicago W. Division High School	Geo. P. Welles,	"
Hyde Park High School	Wm. H. Ray,	"
Marengo High School	C. M. Bardwell,	"
Kankakee High School	F. M. Tracey,	"
Mattoon E. Side High Schol	I. L. Betzer,	"
Springfield High School	F. R. Feitshans,	Superintendent.
Monticello High School,	F. V. Dilatush,	Principal.
Warren High School	D. E. Garver,	"
Peru High School	R. L. Barton,	"
Peoria High School	Geo. E. Knepper,	"
Galena High School	O. P. Bostwick,	"
Shelbyville High School		
Sycamore High School	A. J. Blanchard,	"
Rochelle High School	A. V. Greenman,	"
Rossville High School	S. B. Messer,	"
Bement High School	C. W. Groves,	"
Oakland High School	Moses Andrews,	"
Jacksonville High School	H. M. Hamill,	Superintendent..
Danville High School	S. Y. Gillan,	Principal.

Charleston High School................	E. J. Hoenshel,	Principal.
Tuscola High School..................	W. B. Wilson,	"
Streator High School..................	R. Williams,	"
Ottawa High School....................	C. W. Tufts,	"
Bloomington High School.............	J. W. Heninger,	"
Aurora E. Side High School............	N. A. Prentiss,	Superintendent.
Paris High School.....................	A. Harvey,	"
Washington High School..............	J. L. Hartwell,	Principal.

UNIVERSITY DISCOURSES.

FOURTH SERIES.

During the winter and spring terms, discourses have been delivered in the University Chapel on Sunday afternoons, as follows:

Feb. 7. REV. RICHARD EDWARDS, LL. D.
Subject: Human Responsibility.

Feb. 28. REV. O. CLUTE.
Subject: The Things which are Unseen are Eternal.

Mar. 21. REV. A. K. PARKER, D. D.
Subject: Loyalty to Truth.

Apr. 11. JOHN V. FARWELL, Esq.
Subject: What is Truth?

May 2. REV. W. H. VIBBERT, S. T. D.
Subject: What think ye of Christ?

SOCIETIES.

The Literary Societies have from the opening of the University enjoyed its fostering care.

The ADELPHIC and PHILOMATHEAN Societies for men and the ALETHENAI for women, occupy spacious halls which the members have furnished and decorated with taste and elegance. Meetings are held on Friday evenings throughout term time, are well attended, and are maintained with unflagging interest. They furnish excellent drill in writing, speaking, and parliamentary methods.

The YOUNG MEN'S and YOUNG WOMEN'S CHRISTIAN ASSOCIATIONS are active and useful.

Special organizations unite the students of NATURAL HISTORY, of CIVIL ENGINEERING, and of MECHANICAL ENGINEERING.

FRATERNITIES.

After careful and thorough investigation, the Trustees and Faculty have agreed that the original policy of the University towards these organizations should be maintained, and that the regulations which forbid the introduction here of the College Fraternities, sometimes called the Greek-letter Societies, should remain in force. All the useful purposes which such societies subserve are secured from the existing literary societies.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as president of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law, the following system of Degrees has been adopted for the University:

1. All studies will remain, as heretofore, free. Each student may choose and pursue such studies as he may desire, subject only to such condition as to preparation, times of study, and number of studies, as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree, and must present an accepted thesis.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statements of work done and credits attained.

4. It is designed that the requirements for all the Bachelor's Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The Degree of Bachelor of Letters, B. L., will be given to those who complete the course of the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course in the School of Ancient Languages.

8. The Master's Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be given only to those who have pursued a year of prescribed post-graduate studies, and passed examinations thereon, or after a term of three years' successful practice. In either case an accepted thesis will be required.

BOARD.

There are many boarding-houses in Urbana and Champaign within reasonable distance of the University, where students can obtain either table board, or board and rooms, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to $2 per week. Some students prepare their own meals, and thus reduce expenses still farther.

For estimates of annual expenses, see page 96.

The Young Men's Christian Association of the University will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and renumerative labor.

Educational labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The maximum rate paid for farm, garden, and shop labor, is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases, it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from a College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such, these words are addressed:

1. Notice that a College or a University (which is properly a collection of Colleges) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading, and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 31 and 32.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other prepar-

atory studies required for admission to College (See pp. 89–90.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. All College studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters. Amount $10.00

THE TERM FEE for Incidental Expenses is for each student.. 7.50

Each student working in Laboratories, or in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to $12, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter* Classes.

The following are estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University:

	Min.	Max.
Term Fees and Room Rent for each student	$ 28.50	$ 34.50
Table Board in Boarding Houses and Clubs	72.00	144.00
Fuel and Light	10.00	15.00
Washing at 75 cents per dozen	13.50	27.00
Total amount	$124.00	$220.50
Board and Room in Private Houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR, OR IN THE BUILDERS' OR FARMER'S SHORT COURSES.

Tuition per Term	$ 5.00
Incidental Fee, per Term	7.50

SPECIAL FEES.

For Instrumental Music, for 20 Lessons	$10.00
For painting or Drawing, to special Students	10.00
Matriculation Fee	10.00
Graduation Fee	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money,* without the authoritative care of some prudent friend. Half the dissipation in colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills, and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under twenty years of age.

CALENDAR FOR 1886-7.

Examinations for Admission	Monday,	September 13
First or Fall Term begins	Wednesday,	September 15
First Term ends	Wednesday,	December 22

WINTER VACATION.

FOR 1887.

Examination for Admission to Advanced Classes,	Tuesday,	January 4
Opening of the Second or Winter Term	Wednesday,	January 5
Second Term ends	Wednesday,	March 23
Third or Spring Term begins	Thursday,	March 24
Baccalaureate Address in University Chapel	Sunday,	June 5
Class Day	Monday,	June 6
Alumni Day	Tuesday,	June 7
Commencement	Wednesday,	June 8

SUMMER VACATION.

Examinations for Admission	Monday,	September 12
First or Fall Term begins	Wednesday,	September 14

LIST OF GRADUATES.

Alumni of the University are requested to send to the Regent's office timely notice of any changes which should be made in the following lists for future publication.

1872.

NAME	OCCUPATION.	RESIDENCE.
Burwash, Milo B	Farmer	Champaign.
Davies, John J—B S	Physician	Racine, Wisconsin.
Drewry, Henry N	Physician	Effingham.
Flagg, Alfred M Capt	Lawyer	Sioux Falls, Dakota.
Hatch, Miles F	Lumberman	New Tacoma, W. T.
Lyman, George H	Civil Engineer	Little Rock, Ark.
Mathews, James N	Physician	Mason.
Parker, C E	Banker	Philo.
Reiss, Willis A	Teacher	Belleville.
Reynolds, S A Capt	Lawyer	Chicago.
Rickard, Thomas E Capt	Farmer	Springfield
Ricker, N Cliff'd—M Arch		Champaign.
Professor of Architecture, University of Illinois.		
Rolfe, Charles W—M S		Champaign.
Assistant Professor of Geology, University of Illinois.		
Silver, Charles W	Merchant	Newton, Kansas.
Silver, Howard	Prin. Pub. Sch'ls	Hutchison, Kansas.
Teeple, Jared	Merchant	Marengo.
Wharton, Jacob N	Machinist	Bement.
Whitcomb, Alonzo L	Physician	Tolono.
Wood, Reuben O Capt	Farmer	Woodburn.

1873.

Graham, Charles P	Clergyman	New Salem, Kansas.
Hatch, Fred L	Farmer	Spring Grove
Hayes, Charles I—B S	Assayer	Denver, Col.
Hennessey, Augustus L	Editor	Chicago.
Hill, Edgar L Capt	Farmer	Austin, Texas.

NOTE —Graduates who have the rank of Captain have received commissions from the Governor of the State, as Captains in the Illinois National Guard.

NAME.	OCCUPATION.	RESIDENCE.
Hook, Samuel H	Miner	Black Hills, Col.
Morrow, Andrew T	Farmer	Tonganoxie, Kansas
Ockerson, John A—B S		St. Louis Mo.
Engineer, U. S. Lake and River Survey.		
Phillips, Parley A	Farmer	Damascus
Platt, Franklin C Capt	Lawyer	Waterloo, Iowa.
Porterfield, Elijah N	Co Surveyor	Kearney, Neb.
Robbins, Henry E	Prin Pub Schools	Lyons, Iowa.
Swartz, Alex C—C E	Real Estate Agt	Beulah, Kansas
Williams, Lewis E	Farmer	Montrose, Iowa

1874.

Baker, Ira O—C E		Champaign.
Professor of Civil Engineering, University of Illinois.		
Campbell, John P	Physician	Milton.
Drewry, Ebenezer L	Lawyer	Effingham.
Eaton, Herbert	Printer	Champaign.
Ells, William C		Strong City, Kansas
Supt of Construction A., T. & S. F. and M. C. R Rs.		
Estep, Harvey C	Civil Engineer,	Olympia, W. T.
Foster, Charles W	Lawyer	Chicago
Gabrialial, Gregory	Missionary	Asia Minor.
Gennadius, Panagiottis, B S		Athens, Greece.
Commissioner of Agriculture.		
Jeffers, Charles P	Druggist	Swampscott, Mass.
Pickrell, William	Farmer	Pickrell, Nebraska.
Pierce, John L—B A	Lawyer	Norfolk, Nebraska
Reynolds, Henry S—M S	Assayer	Glendale, M. T.
Smith, Charles A—B S	Draughtsman	Providence, R I
Storey, George	Civil Engineer	San Diego, Cal.
Watts, William	Physician	Sylvania, Ohio
Wharry, Walter W Capt	Salesman	Philadelphia, Pa.
Cheever, Alice	Mrs A H Bryan	Champaign
Potter, F Adelia—B L	Mrs H S Reynolds	Glendale, M T.

1875.

Barnard, D E	Farmer	Manteno.
Barnes, Arthur E—B S	Druggist	Topeka, Kansas.
Brown, Dillon S	Banker	Genoa.
Brown Ralph L—M L	Real Estate Agt	Aberdeen, Dakota.
Coddington, Vantile W	Architect	Kansas City, Mo.
Dobson, Franklin P Capt	Civil Engineer	Mitchell, Dakota

NAME.	OCCUPATION	RESIDENCE.
Dunlap, Burleigh A	Lawyer	Urbana.
Dunlap, Henry M	Farmer	Savoy.
Eaton, Ernest	Editor	Champaign.
Everhart, Winfield S Capt	Lawyer	Toledo.
*Falkner, James Capt	Oct 2, 1882	Bloomfield.
Gridlev, George N	Farmer	Half Day.
Kenower, George F–M L	Farmer	Bolivar, Mo.
Lefler, John E	Clergyman	Leavenworth, Kan.
Lyman, Charles C—B S	Vet Surgeon	Minneapolis, Minn.
McCauley, John C	Prin Pub Schools	Wilmington.
Mueller, John—B S	Physician	Ann Arbor, Mich.
Parks, James H	Land Agent	Clarendon, Texas
Parsons, F A—M L	Banker	Scott City, Kan.
Patch, Emory	Machinist	Janesville, Wis.
Pickrell, Watson	Farmer	Pickrell, Neb.
Pollock, William C	Lawyer	Mt Vernon.
Robinson, Elna A	Machinist	Champaign.
Scovell, Melville A—M S		Lexington, Ky.
Professor of Agricultural Chemistry, Ky. Agl. College		
Scudder, Clarence O	Prin Pub Schools	Pekin.
Shawhan, George R—B L		Urbana.
County Superintendent of Schools, Champaign County.		
Tyndale, Henry H	Lawyer	London, England.
Warner, L Fenn	Draughtsman	Auburn, Cal.
Anderson, Laura	Mrs J R Greenhalgh	Champaign.
Campbell, Amanda	Mrs Milt'n Moore	Mansfield.
Hullinger, Kate	Mrs Sterling	Parker, Dakota
Kariher, Kate	Mrs Albert Eisner	Champaign.
Kellogg, Flora L	Mrs Hudson	Coldwater, Iowa.
Lee, Alice—B L	Mrs V W Coddington	Kansas City, Mo.
Pierce, Fannie	At home	Champaign.
Steele, Mary C—B L	Mrs N C Ricker	Urbana
Stewart, Maggie E—B L	Mrs H E Robbins	Lyons, Iowa.

1876.

Allen, Ralph	Farmer	Delavan.
Ballou, Edward L	Assayer	Igo, Cal.
Campbell, James W	Lawyer	Topeka, Kansas.
Chandler, William B	Farmer	Yankton, Dakota.
Clark, Charles W	Civil Engineer	St Louis, Mo
Drake, James F	Lawyer	South Pueblo, Col.
Gill, John D	Lawyer	Chicago.

*Deceased

NAME.	OCCUPATION.	RESIDENCE.
Gore, Simeon T	Architect	Chicago.
Gregory, Charles E Capt	Lawyer	Carrington, Dakota.
Knibloe, Walter E	Prin High School	St Augustine, Fla.
Mackay, Daniel S	Lawyer	Mt Carroll
Mackay, Henry J	Lawyer	Mt Carroll
Mackay, William A Capt	US Post. Service	Mt Carroll
Mahan, H Weston	Merchant	Champaign.
*Mann, A Howard	April 23, 1879	Winnebago, Cal.
Mann, Frank I Capt	Nurseryman	Gilman.
Mann James R Capt	Lawyer	Chicago
Noble, Louis R Capt—B S	Mech Engineer	Mattoon.
Oliver, Will F Capt	Physician	Howard, Kansas
Palmer, Frank M Capt	Lawyer	Kansas City, Mo.
Pierce, Elon A	Teacher	Santa Rosa, Cal.
Rhodes, James F	Lawyer	Durango, Col.
Scribner, Artemus C	Lawyer	Minneapolis, Minn.
Starr, Frank A E Capt	Lawyer	Portland, Oregon.
Stookey, D Wesley	Tile Manufact'r	Buffalo.
Weston, Charles H	Lawyer	Portland, Oregon.
*Wild, George A Capt	Nov., 1881	Las Animas, Col.
Williams, Thomas T	Farmer	Sterling.
Holton, Mattie S	Artist	Chicago.

1877.

Abbott, Theodore S—B S	Civil Engineer	Laredo, Texas.
*Allen, Charles W—B L	July 8, 1880	Harristown.
Barry, Charles H Capt	Insurance Agent	Alton.
Barry, Frank Capt—B L	Special Fr't Agt	Minneapolis. Minn.
Blackall, C H Capt—M A	Architect	Boston, Mass.
Brush, Charles E	Architect	Carbondale
Buckingham, William	Lawyer	Chicago.
Bumstead, James E	Physician	Dundee.
Clay, Luther G	Nurseryman	Cobden.
Crow, Benjamin F	Manager Mfg Co	Nebraska City, Neb.
Elliott, Charles G	Civil Engineer	Tonica.
Faulkner, Richard D	Merchant	San Francisco, Cal.
Gibson, Charles B Capt Professor of Chemistry, College of Physicians and Surgeons.		Chicago.
Gilkerson, Hiram Capt	Farmer	Hampshire.
Gilkerson, John	Lawyer	Hampshire.
Kennedy, Allan G Capt	Manufacturer	Minneapolis, Minn.
Lewis, Edward V Capt	Manufacturer	Council Bluffs, Ia.

NAME.	OCCUPATION	RESIDENCE.
Llewellyn, J C—B S	Supt Street R R	St. Louis, Mo
*McPherson, John	Jan 26. 1886	Lexington, Ky.
Moore, John F	Architect	Minneapolis, Minn.
Rice, Geoige C	Farmer	Charity.
Seymour, John J	Civil Engineer	Richmond, Ind.
Sim, Coler L Capt	Druggist	Topeka, Kansas.
Spencer, Franklin	Farmer	Nauvoo.
Stayman, John M	Machinist	Sterling, Kansas.
Stoddard, Ira J Capt	Civil Engineer	Oskaloosa, Iowa.
Ward Walter P—B L	Lawyer	Spencer, Iowa
Witham R F Capt—B L	Farmer	Olympia, W. T.
Wright, Myron J	Farmer	Woodstock.
Adams, Nettie	Mrs W B Wilson	Indianapolis, Ind.
Bogardus, Eva	Artist	Champaign.
Broshar, Cornelia	Artist	Champaign.
Conn, Emma	Music Teacher	Champaign.
Falls, Ida Bell	At home	Champaign.
Gregory, Helen B—B A		Champaign.
Instructor in Modern Languages, University of Illinois		
Maxwell, Emma C	At home	Philadelphia, Pa.
Page, Martha	Mrs R F Whitham	Olympia, W. T.
Piatt, Emma C—B S	Mrs J C Llewellyn	St. Louis, Mo.
Skinner, Velma E	Mrs W P Ward	Spencer, Iowa
Smith, Avice	Physician	Kansas City, Mo.
Switzer, Gertrude	Mrs H Peddicord	Champaign.
Victor, Carrie.	Teacher	Sisseton, Dak.

1878.

Baker, Edward J—B S	Farmer	Savoy.
Bailard, Charles K—B S	Real Estate Agt	Chicago
Bridge, W E—B S Capt	Farmer	Detroit, Mich.
Brown, Frank A	Lawyer	Huron, Dak.
Bullard, Samuel A—B S	Architect	Springfield.
Burr, Ellis M—B S	Machinist	Champaign.
Cofflin, Frank S	Lawyer	Taylorville.
Coffman, Noah B—B S	Cashier	Hebron, Neb.
Dean, Frank A Capt	Merchant	Ulysses, Neb.
Francis, Fred	Watchmaker	Elgin.
Gaffner, Theodore	Physician.	Trenton.
Gregory, A T—B A Capt	Real Estate	Atlanta, Ga.
Hauser, Henry—B S Capt	Civil Engineer	Socorro, Col.

NAME.	OCCUPATION.	RESIDENCE.
Lee, Ed O—B L	Lawyer	Mt. Carroll.
Lloyde, Frank H	Merchant	Champaign.
McLane, James A—B S	Real Estate	Chicago.
Moore, Aaron H		
Morava, Wensel-B S Capt	Machinist	Chicago
Patchin, John	Lawyer	Grass Lake, Mich.
Pollock, James L—B L	Lawyer	Mt. Vernon.
Richards, Chas L—B S	Lawyer	Chicago.
Rudy, William D—B S	Governm't Cl'k	Washington, D C.
Rutan, Abram R	Farmer	Renton, Texas.
Savage, Manford—B L	Lawyer	Hebron, Neb.
Sawyer, Hamlin W Capt	Farmer	Champaign.
Sparks, Hosea B Capt	Miller	Alton.
*Spradling, William F	Nov 30, 1881	Greenleaf, Kan.
Sprague, Martin	Lawyer	Springfield.
Weed, Mahlon O—B S	Teacher	Greenwood, Neb
Whitlock, J F Capt—B S	Lawyer	Huron, Dak.
Ziesing, August Capt—B S	Civil Engineer	Chicago
Zimmerman, H W—B L	Chemist	La Salle.
Columbia, Emma	Mrs J R Mann	Chicago
Culver, Nettie M—B L		Kansas City.
Davis, Nannie J	Mrs M A Scovell	Lexington, Ky.
Deardorf, Sarah C—B S	Mrs B F Donnell	Winfield, Kan.
Estep, Ida M	Physician	Olympia, W. T.
Estep, Jessie	At home	Rantoul.
Larned, Mary S	Mrs F A Parsons	Scott City, Kan
Mahan, Jennie C	Mrs P W Plank	Chicago.
Page, Emma—M L	Music Teacher	Kansas City, Mo.
Page, Mary L—B S	Architect	Kansas City, Mo.

1879.

Beardsley, H M—M L	Lawyer	Champaign
Bourne, Henry P—B S	Civil Engineer	Alamosa, Col.
Butler, William N	Lawyer	Cairo.
Coburn, R P Capt—B S	Merchant	San Antonio, Texas
Freijs, Charles T Capt	Architect	Chicago.
Gunder, James—B S	Civil Engineer	Fairmount.
Hoit, Otis W—B S	Farmer	Geneseo.
Johnson, William P Capt	Manager Coal Co	Milwaukee, Wis.
Kays, Emery	Farmer	Buda
Kimble, Willis P—B S	Civil Engineer	Chihuahua, Mexico.

NAME.	OCCUPATION.	RESIDENCE.
Kuhn, Isaac—B S	Merchant	Prescott, Arizona.
Lee, Elisha—B S	Farmer	Hamlet.
*Milton, Franklin S—B S	July 23, 1882	Plattville, Col.
Stanton, S C Capt—B S	Physician	London, England.
Swannell, Arthur Capt	Merchant	Kankakee.
Taft, Lorado Z—M L	Sculptor	Paris, France.
Thompson, W A–B S Capt	Merchant	Chicago.
Walker, Francis E Capt	Farmer	Champaign.
Whitmire, Clarence L	Physician	Metamora.
Butts, Augusta E—B. S	Teacher	Chicago.
Hale, Belle—B S	Teacher	Kewanee.
Kimberlin, Nettie D	Teacher	Mendota.
McAllister, Nettie C–B L	Mrs J H Miller	Sheridan.

1880.

NAME.	OCCUPATION.	RESIDENCE.
Bley, John C—B L	Machinist	Rockford.
Briles, Bayard S—B S	Physician	Etna ?
Conklin, Roland R	Banker	Kingman Kas.
Cook, Charles F—B S	Merchant ?	Edwardsville ?
Groves, Charles W	Teacher	Bement.
Hafner, Christian F		Oak Park.
Harden, Edgar E	Banker	Liberty, Neb.
Hatch, Frank W—B A		Garden Prairie.
Hyde, Benjamin F	Draughtsman	Chicago.
Jones, Richard D	Lawyer	Henry.
Kingsbury, Charles S–B L		Leadville, Col.
Neely, Charles G—B L	Lawyer	Chicago.
Parker, William L—B S	Machinist	Chicago.
Robinson, A F—B S	Bridge Engineer	Minneapolis, Minn.
Robinson, A S–B S Capt	Editor	Decatur.
Savage, George M—B L	Lawyer	Elma, W. T.
Sondericker, Jerome–C E Instructor in Applied Mechanics, Mass. Inst of Tech.		Boston, Mass.
*Travis, William W	Sept. 30, 1883	Bloomington
White, Frank—B S		Stillman Valley ?
Bacon, Kittie I—B L	Teacher	Champaign.
Batcheler, Augusta	Mrs W T Eaton	Kansas City, Mo.
Lucas, Corda C	Teacher	Champaign.
Parker, Minnie A—B L	Teacher	Decatur.
Pearman, Ida—B L	Mrs C E S evens	Logansport, Ind.
Watson, Ella M—B S	Mrs J H Davis	DeKalb.

1881.

NAME.	OCCUPATION.	RESIDENCE.
Allison, James G	Stenographer	Galveston, Tex
Armstrong, James E–B S	Teacher	Englewood.
Beach, Bayard E—B L	Real Estate	Huron Dak.
Bellamy, Albert	Merchant	Girard.
Birney, Frank L	Physician	Sadorus.
Boothby, Arthur—B S	Draughtsman	Providence, R. I.
Boyd, Comma N Capt	Farmer	Sheffield.
Coddington, Arch O–B L	Prin Pub School	Barrington.
Cooper, Fred E—B S	Druggist	Van Buren, Ark.
Davis, Arthur E—B L	Medical Student	St. Louis, Mo.
Dennis, C H—B L Capt City Editor Chicago News.		Chicago.
Dressor, John C—B S	Bookkeeper	Jacksonville.
Forsyth, James	Engineer	Los Angelos, Cal.
Hammet, F W–B S Capt	Farmer	Camargo.
Hill, Fred L	Civil Engineer	Burlington, Iowa.
Hill, T C—B A Capt	Teacher	Kensington
Kingman, Arthur H	Supt Gold Mines	Charlotte, N. C.
McKay, Francis M—B L Principal Washington Public School		Chicago
Mansfield, Willis A—B L	Physician	Metamora.
Mason, William E—B S	Farmer	Buda.
Morse, John H Capt	Deputy Sheriff	Metamora.
Pearman, J Ora—B S	Physician	Chicago.
Pepoon, Herman S—B S	Physician	Lewiston, Ills.
Pepoon, William A	Farmer	Riverside, Id.
Philbrick, E—B S Capt	Civil Engineer	Chicago.
Pletcher, Francis M—B S	Farmer	Fort Niobrara, Neb.
*Porter, Frank H—Capt	1885	San Jose, Cal.
Ross, Sprague D—B S	Local Historian	Princeton.
Schwartz, Joseph	Druggist	Salem.
Seymour, Arthur B—B S Professor of Botany and Horticulture, University of Wisconsin.		Madison, Wis
Slade, Byron A–B S Capt	Drug Clerk	Wabasha, Minn.
Stacy, Morelle M—B L	Stenographer	Chicago
Sturman, James B—B L	Lawyer	Kansas City, Mo.
Talbot, A N—C E Capt Assistant Professor Mathematics and Engineering, University of Illinois.		Champaign.
Weston, Wm S–B L & B S	Electrican	Chicago.
Wilson, Maxwell B	Farmer	Paris.
Baker, Kittie M Instructor in Music, University of Illinois.		Champaign.

NAME.	OCCUPATION.	RESIDENCE.
Barnes, Bertha E—B L	Mrs S D Ross	Princeton.
Davis, Marietta—B L	Mrs H M Beardsley	Champaign.
Elder, Loretta K—B L	Mrs A F Robinson	Minneapolis, Minn.
Hammett, Jennie M—B S	At home	Camargo.
*Lawhead, Lucie M—B L	May 1, 1884	Champaign.
Lawrence, Nettie E	Mrs J A Allen	Tulare, Cal.
Macknet, Metta M I—B A	Mrs B E Beach	Huron, Dak.
Thomas, Darlie—B L	Bookkeeper	Bloomington.
Wright, Jessie A—B L	Teacher	Champaign.

1882.

Bailey, S G Jr Capt—B S	Merchant	Chicago.
Barnes, Charles C	Supt Sugar Fac'y	Franklin, Tenn.
Bridge, Arthur M Capt	Farmer	Goldfield, Iowa.
Bullard, Benjamin F—B L	Teacher	Arlington Heights.
Bullard, George W—B S	Architect	Springfield.
Carman, W B Capt—B S	Physician	Rochester, N. Y.
Cole, Edward E Capt	Teacher	Grand Island, Neb.
Curtiss, William G	Farmer	Nora.
Davis, Jeptha H	Farmer	De Kalb.
Eichberg, David Capt—BL	Lawyer	Chicago.
Eisenmayer, A J Capt—BS	Merchant	Trenton.
Harrison, Samuel A—B A	Prin Pub School	St Joseph.
Merritt, Charles H	Bank Clerk	Mason City.
Neely, John R—B L	Governm't Clerk	Washington, D. C.
Noble, Thomas	Civil Engineer	Monterey, Mexico.
Orr, Robert E Capt—B S	Civil Engineer	Chicago.
*Palmer, Charles W—BL	July, 1884	Austin, Texas.
Peabody, Arthur—B S	Architect	Chicago.
Richards, Geo W—BS Capt	Mining Engineer	Starkville, Col.
Roberts, Charles N—B S	Draughtsman	Jefferson.
Rugg, Fred D—B L	Merchant	Champaign.
Sharp, Abia J Capt—B S	Machinist	East Lynne, Mo.
Shaudeman, Frank—B S	Electrician	Decatur.
Slauson, Howard—B S	Law Student	Champaign.
Smith, Chas L Capt—BL	Lawyer	Champaign.
Spencer, Nelson S—B S	Architect	Beatrice, Neb.
Taft, Florizel A—B S	Bank Clerk	Hanover, Kan.
Todd, James—B S	Farmer	Elgin.
Turner, Herbert Capt	Farmer	Campbell, Minn.
Wadsworth, J G Capt	Clerk	Council Bluffs, Ia.

NAME.	OCCUPATION.	RESIDENCE.
Andrus, Dora A--B L	Teacher	Ashton
Avery, Kittie C B L	At home	Omaha, Neb
Cole, Fronia R	Mrs W F Hall	McLeansboro
Raley, Arvilla K	At home	Granville

1883.

Abbott, Edward L B S	Bridge Construc	New York City.
Adams, Charles F	Naturalist	Auckland, N Zealand.
Bogardus, C Eugene B S	Merchant	Flattville.
Brainard, Clarence	Civil Engineer	St. Louis, Mo.
Craig, William P Capt	Teacher	St. Joseph.
Gates, Alphonso S B S	U S Dep Min'l Sur	Spearfish, Dak.
Goltra, Wm F Capt B S	Civil Engineer	Bloomington.
Gray, Nelson A Capt B L	Farmer	Thomasboro.
Haven, Dwight C Capt	Law Student	Joliet.
Heath, Wm A B L	Bank Clerk	Champaign.
Hewes, George C B S		Champaign.
Assistant in Chemistry, University of Illinois.		
Huey, Joseph D	Postmaster	Huey.
Kenower, John T B S	Farmer	Bolivar, Mo.
Lewis, Ralph D		Chicago.
McCune, H L Capt B L	Lawyer	Ipava.
Moore, William D	Drainage Engin'r	Chatham.
Palmer, Arthur W B S		Cambridge, Mass.
Assistant in Chemistry, Harvard College		
Peirce, Fred D Capt B S	Druggist	Chicago.
Piatt, Silas H	Express Agent	Miles City, Mon.
Scotchbrook, Geo P B S		Wessington, Dak.
Sondericker, William B A	Medical Student	Chicago.
Weis, Joseph B S	Chemist	Chicago.
Ashby, Lida M B L	Teacher	Hebron, Neb.
Boggs, Hattie M B A	Teacher	Tuscola.
Colvin, Mary S	At home	Normal.
Fellows, Clara B B L	Teacher	Millbank, Dak.
Gardner, Jessie B L	At home	Champaign.
Healy, Grace B L	At home	Champaign.
Knowlton, Lizzie A B L	Teacher	Champaign.
Langley, M Celeste B L	Student	Boston, Mass.
Lewis, C Florence B L	Mrs C J Bills	Endicott, Neb.
Peabody, Kate F B L	Teacher	Jefferson.
Stewart, Ella M	Teacher	Champaign.
Wright, Minnie E B L	At home	Champaign.

1884.

NAME.	OCCUPATION.	RESIDENCE
Abbott, Wm L	Draughtsman	Chicago.
Austin, James	Draughtsman	East Dubuque.
Babcock, Guy H Capt	Farmer	Ridott.
Barber, Henry H B S	Civil Engineer	Gordon, Nebraska.
*Bartholf, Emmet G B A	Dec 28, 1884	Chicago.
Bartholf, Wm J B A	Teacher	Davenport, Iowa.
Braucher, Arthur C B S	Mining Engineer	Carthage, N M
Chapman, Norman W	Civil Engineer	Lusk, Wy.
Eberlein, Frederic W B S	Physician	Mascoutah.
Herdman, F E Capt B S	Machinist	Chicago.
Hunt, Thomas F B S		Champaign.
Assistant in Agriculture, University of Illinois.		
Kimball, Edward R B S	City Engineer	Omaha, Nebraska.
Lietze, Frederic A B S	Draughtsman	Chicago.
Lilly, Charles H B S	Merchant	Thomasboro.
Lilly, James E	Agent	Chicago.
McCluer, Geo W B S		Champaign.
Foreman of Horticultural Department, University of Illinois.		
Montezuma, Charles B S	Druggist	Chicago.
Morgan, George N B L	Student	Kinmundy.
Parr, Sam'l W B S		Jacksonville.
Professor of Natural Sciences, Illinois College.		
Philbrick, Solon Capt	Law Student	Champaign.
Roberts, L C Capt B S	Agent	Oakland, Cal.
Rupp, Andrew O B L	Teacher	Bloomington.
Sizer, Lucius N Capt B S	Civil Engineer	Mahomet.
Speidel, Ernest B S	Chemist	Aurora.
Stevens, Hubert A B S	Civil Engineer	Chicago.
Stratton, Sam'l W Capt		Champaign.
Instructor in Mathematics, University of Illinois.		
Van Petten, H S B S	Druggist	Pawnee, Neb
Vial, Edmund R B S	Farmer	Western Springs.
Wills, Jerome G B L	Teacher	Vandalia.
Ayers, Nettie B L	At home	Urbana.
Barber, Ella U B L	Teacher	Urbana.
Braucher, Alma E B S	Medical Student	Lincoln.
Campbell, Juniata G B L	Teacher	Aurora.
Clark, Lucy J	At home	Champaign.
Conkling, Anna J B L	Mrs A B Seymour	Madison, Wis.
Ellis, Lola D B L	Mrs J Forsyth	Los Angeles, Cal.
Hall, Lucy A	At home	Champaign.

NAME.	OCCUPATION.	RESIDENCE.
Hill, Cora J	Stenographer	Chicago.
Kemball, Georgetta B L	Teacher	Pana.
Krause, Josephine	At home	Englewood.
Sim, Kitturah E B L	Teacher	Urbana.
Smith, Laura B B L	At home	Champaign.

1885.

Abbott, A N Capt	Farmer	Union Grove
Ayers, J F		Urbana
Braucher, W B	Machinist	Lincoln
Carter, H L		Humbolt
Cole, Ed T	Medical Student	Chicago
Colton, Simeon C B S	Engineer	Chicago
Dunlap, R L	Farmer	Savoy
Ellis, Geo H B S	Chemist	Milwaukee
Hicks, Geo L B L	Farmer	Warren
Hopper, Chas S	Cashier	Sandwich
Kendall, Wm F B S	Civil Engineer	Leavenworth, Kan
Kent, James M B S	Mech Engineer	Chicago
Lantz, Milo P Capt B S	Farmer	Oak Grove
Lattin, Judson Capt B S	Draughtsman	Pullman
Manns, A G B S	Student Univ. of	Berlin, Germany
Marshall, S L Capt B L	Student	Jacksonville
Miller, John A—B S	Student Univ. of	Berlin, Germany
Morse, E L—B S Capt	Civil Engineer	Diamond Bluffs, Wis
North, A T		Kewanee
Petty, Geo R	Farmer	Pittsfield
Rankin, C H		Fall Creek
Reynolds, H L—B S	Machinist	Erie, Pa
Roberts, V B	Civil Engineer	Chicago
Ronalds, H L—B S	Machinist	LaCrosse, Wis
Schleder, T H—B S	Draughtsman	Louisville, Ky
Schrader, A T	Civil Engineer	East Dubuque
Smith, W H		Champaign
Stockham, W H Capt B S	Machinist	Bridgeport, Conn
Swern, W C	Draughtsman	Atlanta, Ga
Vial, F K B S	Student U of I	Urbana
Wright, Jno E	Reporter	Chicago
Woodworth, C W—B S	Student U of I	Urbana
Clark, Kate F—B S	A. Home	Cobden
Earle, Mary T—B S	At Home	Cobden

NAME.		OCCUPATION.	RESIDENCE.
Jones, Emma T	B S	Teacher	Champaign
Merboth, Louisa		At Home	Spring Bay
Owens, Bessie W		At Home	Urbana
Paullin, L E		Teacher	Atlanta
Plank, Besse G		Teacher	Champaign
Switzer, Lottie		Teacher	Philo
Weston, Abbie		Teacher	Champaign
Wills, Etta G		At Home	Vandalia
Wright, Lizzie W		At Home	Chicago
Zeller, Josephine		At Home	Spring Bay

ABSTRACT OF OCCUPATIONS.

	MEN.	WOMEN.	TOTAL.
Farmers	55		55
Civil Engineers	37		37
Machinists	28		28
Mining Engineers	6		6
Architects	11	1	12
Druggists and Chemists	19		19
Mercantile	38	1	39
Teachers	33	28	61
Clergymen	3		3
Lawyers	47		47
Physicians	23	3	26
Editors	7		7
Miscellaneous	23	5	28
Not Specified	13	24	37
Women Married		33	33
Died	11	1	12